

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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## Slight Rise In DP Salary Levels Seen

By Michael Merritt  
CW Staff Writer

PALO ALTO, Calif. — Salaries of programmers and other DP personnel have risen in the last year, according to the most recent survey by Source EDP, a national planning and research organization.

The Source conclusion differs from that of the Robert Half agencies, which saw a 2% to 10% drop in starting salaries [CW, April 14]. Source sees a slight rise in DP salary levels, generally 1% to 2%.

Speaking on the apparent discrepancy, Source President M.R. Parr told CW: "Employers are anxious to reduce costs at any time, but individual data reflects periods of economic downturns and resulting profit squeeze. We have certainly heard the lower range requested, but we have also observed, and participated in, the resulting increases."

"The compensation is not in the stated ranges but rather in the actual starting salary paid. In point of fact, most employers are still more interested in worth than in price," he said.

In addition, the actual salaries of more than 8,000 computer professionals involved in the Source survey in January 1971 (compared its 1970 survey) shows increases in all but two of the categories.

These two, marketing, representatives and marketing management, reflect the negative influence of the 1970 economic situation of professionals with commissions/bonus compensation plans.

In all of the other 25 categories, there were increases in median salary ranging from a minimal \$140 per year for communications professionals to two years of experience to \$3,030 per year for systems managers in the medium size (IBM 360/30-50, 370/145 or equivalent) installations.

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### Doctor's Helper

These cartoons illustrate them through a medical history interview. The drawing is associated with the following questions: "Have you noticed any coughing or hoarseness lately?" "Have you ever noticed or been told that your heart does something different?" "Have you noticed your skin being dry, burning, itchy or having a rash?" "How often do you get nervous or upset?" Story on Page 4.

### To Measure DP Efficiency

## Compumetrics Group Is Born

By Bryan Higgins  
CW West Coast Bureau

SANTA MONICA, Calif. — It is incredible that we have corporations spending \$2 million to \$30 million a year on computing and they don't know what they are getting for their money. There is no way today of measuring hardware efficiency, software efficiency or results," said Dr. Richard Hammings, president of Bell Labs, who is chairman for the first meeting of the ACM Special Interest Committee on Computer Metrics.

"Here tonight we are finding an entirely new world of knowledge," he said. "We are finding—within 10 years we will be able to predict reasonably well what the software and hardware will do and its uses for management. 'We will have better quality control, better quality hardware and we'll be able to predict better for management.'

In 20 to 30 years Compumetrics will be an established field such as biometrics or psychology," he said.

The speakers felt the mystique of computers may be abolished forever if Compumetrics succeeds. As Robert Gordon, ad hoc president of the group, said: "A bank will add one half million dollars for a computer program without any assurance

that when it is finished it will do the job it is supposed to."

Hammings added Bell Labs had begun a multimillion dollar project that he predicted would fail. There was no measurement available,

able, however, to back up his prediction, so management suffered the costly loss.

"You cannot have a science without measurement," said

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### On the Inside

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## Package Builds Code In Cobol, BAL, PL/1

By Don Leavitt  
CW Staff Writer

BOSTON — User-written programs that include many housekeeping tasks, definitions of files and program control elements and a standardized program sequence, but no detailed problem logic, can be generated in any of three languages by a software system just being introduced in this country.

The Standard Programming Logic (SPL) system, developed in Germany, produces these "skeletons" from either Cobol, Assembly or PL/I, at the user's option, from parameter cards. Output from SPL can be directed to punched cards, magnetic tape, disk or line printer, according to a spokesman for Cullinan Corp., which is marketing the system in the U.S.

SPL can provide read routines, including OPENS and CLOSES, for up to 18 input files and the matching of input records by as many as 18 key fields with different priorities to determine which record should be processed next.

The user, however, has to develop and code in conventional terms the actual problem-solving logic once SPL has made the comparisons and set indicators of the results, Cullinan said.

In addition to defining problem logic, SPL allows the user to insert definitions of the data fields in the input records. The SPL system also has no provision for defining or processing output files. That portion of any program developed under SPL is left completely up to the user.

The SPL-generated program provides data and break control, entry and exit routines and considerable imbedded documentation so that the user can follow the execution program, segment by segment. The locations within the skeleton at which the user must add coding are clearly marked \*\*\* Insert Routine here\*\*\*.

The SPL package is modular allowing the user to include provisions for only the language or language he wishes. The system operates under IBM DOS or OS/360, and even with provisions for COBOL, PL/I and three languages, would require no more than 30K bytes of storage.

The package has also been implemented on the RCA Spectra 40 under TDOS or DOS, Cullinan said.

SPL is priced at \$9,000 for the first language under TDOS and/or third language will be about \$3,000 each. Cullinan Corp. is at One Boston Place, 02108.

## New ICL CPUs May Go to U.S.

By Frank Piatz

CW Staff Writer

NEW YORK — International Computers Ltd. (ICL), England's major manufacturer of computers, has announced its 300/240 24-bit word limit. Memory sizes available are 128K, 192K, 256K, 348K and 512K words. The memory is four-way interleaved.

Peripheral transfers are accomplished independently through a separate Peripheral Processing Unit, which provides up to 43 channels with a total throughput of 11.1M char/sec. Typical configuration prices range from \$25,000 to \$50,000/mon.

The IHC 0405 uses a semiconductor memory with a 300 nsec/word cycle time and a 1.75 msec access time. Memory sizes are 128K, 256K, 320K, 480K, 512K and 737K words. Main storage may be reconfigured by means of operator switches. The PAC (Peripheral Autonomous Controller) includes 38 channels with a total

throughput of 6 M char/sec. A typical configuration can range from \$25,000 to \$50,000/mon. The IHC 1902 has a 1.75 msec access time and a 6.5 usec cycle time and has a cycle time of 1.5 usec/word. Capacities from 16K to 128K words are available. Six peripheral channels and 18 interface channels are included in the PAC for total access of 1.75 msec.

The IHC 1902 and 1902A are disk-oriented with up to eight drives. The system allows multi-programming up to four programs on configurations of 16K words or more.

The core memory of the 1902A has a 6.5 usec cycle time and is available in capacities of 12K to 32K words. Channel throughput is 320Kchar/sec. The IHC 0925 has a 3 usec cycle time and a 6.5 usec access time, 16K to 48K word capacity. Throughput rate is 600K char/sec.

Prices of typical configurations of the 1902A range from \$4,000 . . . . . (Continued on Page 2)

# Systems People Told to 'Clean Up Their Own House'

By Thomas J. Morton

CW Midwest Bureau

CHICAGO — The time has arrived for the DP professional to "clean up his own act," to start remembering that he is a part of the corporation, pay attention to be certain that his systems are providing information, and not just an electronic form of creative expression for his own people alone, said Wayne E. Swearingen, president of LVO Corp., Tulsa, Okla., told a packed house at the EDP report with the red warning lights on the dashboard of his car. Once, a warning light on his car kept flashing, he said, indicating an overheating engine when in

fact, it was not.

The flashing red light was easy to correct; he simply had it removed, he said. In EDP, the correcting was not always as simple, Swearingen continued.

#### President's Viewpoint

"All the present sees from his systems group (besides a large General and Administrative expense item), is a two-foot stack of computer printout, most of which contain 'control information' stated."

"To apply this to business, that stack of computer outputs is worse than useless to me."

Swearingen suggested that the reams of useless information spewing out of computers under the name of input generated could be reduced if the manager of systems took the time to learn how to work through people.

To fill the needs of top management, systems people had to learn something of management to be able to determine the critical information needed by the top and to reduce the tendency of finding one created "product of his own creative talents," and to bear down on that information "which is crit-

ical to the top man."

David J. DeCrane, speaking on data base management, told his audience that the tide had turned. He said that historically EDP managers had been telling functional users in a corporation how they must run their business so that it would comply with the requirements of data processing.

"Now," he said, "it is time for the systems people to clean up their own house."

Defining a data base as "a common definition of data elements used throughout the organization for the preparation of management information," DeCrane said it is now necessary for the DP professional to look

at his data elements for redundancy.

It was time, he said, for the systems people to "call things the same name everyone else in the corporation called it; eliminate duplication from file to file; and to consider the time frame in dollars values for information retrieval."

"Don't," he said, "build a general ledger report with the response time of an airlines reservation system just because it is possible to do... or possibly more intriguing to do."

DeCrane maintained that a "card system could contain an adequate data base even though the purist would think a sophisticated, file organization tech-

nique in a tree-like structure constituted a data base."

#### Safeguards

Another point covered by the speaker was the preparation of a center for disaster both natural and man-made. Costs of preparation, it was said, could never equal the costs of a disaster.

"One disgruntled employee can wipe out a business," a speaker remarked, emphasizing the fact that with the increase of sophistication of equipment and software, the increase in potential is also increased.

"Hardware is the one commodity that is the easiest to replace and the one that is guarded the most," he stated.

## New ICL CPUs May Go to U.S.

(Continued from Page 1)

to \$10,000/mo while those of the 1962S range from \$8,000/mo to \$18,000/mo.

The new disk system for the 1900 series, the EDS (60), with a capacity of 60 million characters, has nearly twice the capacity of the maximum IBM 2314 system. Either seven or nine

drives, using 11-disk packs, can be used in a system. Average access time is 47.1/2 msec.

The 7002 communications processor allows communication between a 1900 series computer and remote devices, such as teletypewriters, video display units and communications terminals, over telephone and telegraph

lines. It is equipped with a 1.1 usec core memory in sizes from 16 to 32K 16-bit words.

Software announcements for the 1900 include a data base system and new compilers, as well as a new version of the George 3 operating system.

Two interactive compilers, Basic and Fortran (Fortran), have been added to the time-sharing software. Both versions will run under either George 3 or George 4 (paged version of George 3) operating systems.

First deliveries are scheduled for January 1972.

## Data Bank to Hold 100,000 Student Files

LOS ANGELES — Records of 100,000 students at eight Los Angeles community colleges will be kept in a central computer data bank.

The system, which will be in operation next year, will contain no safeguards to prevent misuse of data by college employees, despite recent revelations that at colleges elsewhere school employees leaked supposedly confidential data on political dissenters to the FBI and Army.

Jerald Mueller, director of data processing, stressed that the most sensitive information would be excluded from the data bank. In particular, it will not contain medical, counseling and disciplinary records.

The data bank will contain name and address, past course and grades, prior education, current program and participation in extracurricular activities.

Many colleges view this informa-

tion as confidential but non-sensitive. The FBI and Army, however, expressed a particular interest in getting information on students who participate in black studies programs or who take courses dealing with the USSR or communism.

Mueller said his policy on data release would be up to the deans of the respective schools, but another spokesman said data would be released to school officials, students themselves and law enforcement officers, but would not be released to prospective employers.

#### Two Levels

The data bank will be a two-level system. Identifying information and current program will keep on-line and accessible by IBM 2260 CRT terminals at each school. Other data will be kept off-line.

When the system is fully operational in two years, it will be on

an IBM 360/50. Social Security numbers will be used as student identification numbers.

## ACM Special Interest Group

### To Measure DP Efficiency

(Continued from Page 1)

Hammill said the group have measurement without a science." He told the group that they had only themselves to learn upon.

"The history of mathematics is one where they have screamed and bellowed that different things couldn't be done. Then when sufficient pressure was put upon them they found that yes, the things we told them could be done, could be done. Statisticians are screaming into the unfortunate state. Nothing new will be done with them. This means we are primarily left

with ourselves."

Hammill felt it was essential for the computemetrics group to be formed. One man in an organization can put little or no pressure on his management, he reasoned, but if work is being done outside on the subject, then management has to listen. Hammill, who is a bit of a disengagement kite, and no one understands, he said, the individual knows where to find someone's shoulder to cry on and get the encouragement.

The other purpose of such a group is to supply information which does not necessarily has a three-pronged approach. The group wants to be able to measure the performance of hardware, software and results. When questioned as to whether the decreasing costs of hardware and the hope for more power in hardware didn't indicate efficiency irrelevant, one man in the audience said, "We've been saying that since the 1401 days and it still hasn't happened."

Another attendee cited the case of an IBM 360/91 program running 40 minutes. When asked what the cost was, he said 60% of the time was in a loop. Six statements were changed and the running time was cut 20 minutes.

Hamming said he felt 10% of computer time was inefficient and the remaining 90% used foolishly. "We are so bad at buying bad software and bad machines for the wrong things."

## Second Study Sees Rise in DP Salaries

(Continued from Page 11)

The survey reveals, for example, that the median annual salary of commercial programmers and programmer analysts with one-year experience has risen 2% from \$9,530 to \$9,720 in 1970. Over four years' experience, the salary also rises 2% to \$14,080 for 1971, up from \$13,820 in 1970.

Scientific programmers and programmer analysts do slightly better than their commercial cousins, averaging 10.5% for six months' experience and 11% for one year's experience. For those with over four years' experience the median salary is \$14,350, up from \$13,850, a 1.5% jump.

Systems (software) program-

mers with one to two years' experience are making \$12,530 now, as opposed to \$12,100 in 1970. For the same category with over four years' experience the figures are \$17,420 and \$16,820. Both of these are about 1% increases.

Senior analysts, project leaders and consultants with two to four years' experience are making \$15,040 in 1971, up from \$14,240 in 1970, an increase at 1%. Those with more than four years' experience are making \$17,940, up from \$16,790, another 1% rise.

In the area of management positions, programming managers for medium-sized installations (360/30 to 360/50, or

equivalent) are averaging \$19,070 a year, while in 1970 the median was \$17,150. For large installations (\$20,000 to \$20,890 and \$18,430). Both these increases are in the area of 1.1%.

Systems managers for medium installations are making \$21,260 and for large, \$23,080 in 1971, up from \$18,230 and \$21,360 in 1970.

Operations managers in medium-sized installations average \$14,810, up from \$13,490, and at large installations \$17,190, up from \$16,050.

The complete survey is available from Source EDP, 100 S. Wacker Drive, Chicago, Ill., 60606.



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# Ryan to Quarterback DP Activities for House Unit

CW Washington Bureau

**WASHINGTON, D.C.** — Former pro football quarterback Frank Ryan is preparing to call some of the computer stars of the House to his office. Representative Ryan, on leave as president of his own computer firm, Frank Ryan Computer Services in Cleveland, had been a reserve quarterback with the Washington Redskins the past two seasons.

He recently announced his retirement from the Skins, and on April 1 will become a part-time consultant with the House Administration Committee. On July 1, Ryan will move into an

appointment post as director of information services with the administration unit.

He will assist in the design, purchase and installation of computer systems and the coordination of EDP activities for the House. He will also act as the congressional coordinator of computer operations

team." Freed is the "congressional man," having spent 13-plus years in the House and Senate.

## 'Catching Up'

Since Ryan is still new to the consulting post he now handles, he admits that he has "a little catching up to do." "I'm going through the learning process. I've never been in government circles before."

One of the projects Ryan will become involved with is a display/retrieval system that would enable the House to handle voting and quorum calls on the floor of the lower chamber [CW, March 31]. The system was designed by Informatics Inc. and the design was given over to the clerk of the house about April 1.

"At this stage," Ryan said, "I'm taking a look at Informatics' proposal. We have no specific plans for letting hardware bids for the system right now. This will be a matter of course; we want to review the situation thoroughly. Rather than rush

into something, we'll go at a steady pace which will assure some success."

As a pro quarterback, Ryan's deliberateness aided his success. During a 13-year playing career with the Redskins, the Los Angeles Rams and the Cleveland Browns, Ryan passed for more than 16,000 yards and twice won All-Pro honors.

He has a Ph.D. in mathematics from Rice University, and his Cleveland-based firm, he said, offers a total systems approach in the sports area. The company helps football teams, for example, to use a computer to speed analysis of trends and collating of statistics. The sales and marketing staff last year and this coming season is a Frank Ryan customer.

Looking ahead to his new position on Capitol Hill, Ryan said: "I've gotten some partial impressions so far. There is a great need for automation in several areas, and I have observed a great spirit of cooperation on the Hill" to help put data processing to work for the Congress.

## DP Profile

with the Office of Management and Budget.

"Frank is eminently qualified for the job," said Louis Freed, assistant staff director with the administration committee.

Ryan was among a number of individuals interviewed for the newly created position. "He had the idea of Rep. Wayne L. Hayes (Ohio), chairman of the committee, to bring in a person with computer expertise who would work with someone who has congressional exper-

## NSF Awards Miller 2-Year Grant to Study Privacy, Computers

CW Washington Bureau

**WASHINGTON, D.C.** — The National Science Foundation has awarded a two-year \$160,000 grant to Arthur R. Miller, a law professor at the University of Michigan and a noted privacy advocate, to search for ground rules protecting individual privacy in the computer age.

Miller, author of *"The Assault on Privacy - Computers, Data Banks and Dossiers,"* was lead-off witness earlier this year before Sen. Sam J. Ervin Jr.'s (D-N.C.) Subcommittee on Constitutional Rights. The senatorial group held hearings on computers, data banks and the Bill of Rights [CW, March 3].

The first phase of the NSF-sponsored study will take 12 to 15 months and will involve an investigation of the existing practices in information handling by social scientists, university information systems and some government social welfare agencies.

There will also be studies overseas, where some countries, according to NSF, are further ahead in formulating protective policies.

The second phase of the project will be evaluation of the data and experiences gained and publication of a report offering a computer-privacy-confidentiality program for possible use by data banks.

The paper will also analyze the legal implications and consequences of computer information activities, and explore the feasibility of safeguards.

## Independent Judgment Offered for 370/135

**PHILADELPHIA** — "The 370/135 offers a combination of virtues that few buyers or potential buyers can afford to ignore: impressive price/performance, advanced hardware technology, high-performance peripheral equipment, and proven software."

"Against these virtues, the prospective buyer must weigh the disadvantages of IBM's unbridled support and relatively inefficient software," according to a recent report, *"The IBM System/370 Model 135: An Independent Appraisal,"* by Datapro Research Corp. Copies of the \$10 report are available from 2204 Walnut St., 19103.

## A Rather Expensive VW

**NEW YORK** — Under a new program to go after motorists who have three or more traffic tickets outstanding, the city's Parking Violations Bureau towed away the first 375 cars — a Volkswagen — this week, owing more than \$3,400 in unpaid parking tickets.

Nine city marshals, armed with computer printouts of car descriptions and plate numbers, took to the streets.

With the new system marshals can seize personal property if the violators do not pay up.

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19	Pittsburgh	3	St. Louis
20	New York City	4	Washington
21	Boston	5	Houston
24	Toronto	6	Denver
25	Detroit	7	Los Angeles
26	Pittsburgh	8	San Francisco
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		16	Montreal
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All sessions 9:00 a.m. to 12:00 noon





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One Decision

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## Editorial

### The Special People

At the risk of recreating the computer mystique, it still must be said from time to time that computer people really are special.

It must be pointed out not to make them feel superior but to remind them that they have a special responsibility.

Like the executive and the military commander, their mistakes tend to be magnified out of all proportion to the events that led to the mistake.

This is the reason that executives and commanders often seem to ponder an unnecessarily long time before making apparently simple decisions. And this is why computer people must avoid snap decisions on apparently simple matters.

It's a nice feeling to know that one of your applications is saving a lot of humans a lot of boringly routine work.

But we must also take responsibility for the simple mistakes that create problems for thousands of people.

## COMPUTERWORLD



## Letters to the Editor

### CDP Holders Have Questionnaire

We share Donald R. Collins' interest in improving the CDP and the professionalism which must accompany the exam to make it meaningful [CW, Letters to the Editor, April 14]. Since February, over 100 CDP holders have been actively engaged in developing a program to meet the challenge. We are now concentrating our efforts in three areas: the examination itself, dissemination of knowledge about CDP and what it means, and what type of an organization we should be. We are currently working on a questionnaire (such as Collins suggested) and would appreciate any contact with other local CDP groups doing work of a similar nature. With a pooling of efforts, we have a great opportunity to produce some definitive results.

We encourage others to join with us at the local level to continue this effort.

John A. Driscoll, CDP Chairman

Arthur A. Chapman, CDP Secretary

Ad Hoc Association of CDP Holders

CNA/Insurance  
310 S. Michigan Ave.  
Chicago, IL 60604

### Here's 'Yes' for Involvement

In response to Donald R. Collins' request for opinions regarding CDP examinations, questionnaires etc., please consider this a very strong "yes" vote in favor of Taylor's involvement.

As a CDP holder of the first water (Nov. 23, 1963) and as a member of the 1964 CDP test review board, I know I speak for many when I say that CDP should "evolve away" from DPMA and be elevated to a status formed by a group of concerned others eight years ago. Somebody "inside" the business - like Taylor - needs to make something out of it. A questionnaire would be a hell of a good start!

A.K. McKeehan

Chicago, Ill.

### What Is DPMA's 'Service'?

The Taylor Report, "Members Look More Like Markets From Park Ridge" [CW, April 14], really hit home with me.

I am a member of the Eastern Connecticut Chapter and have yet to find out what the "service" is. They need dues money, they need contributions, they need company participation. But for what?

In fact, it is a social organization which because of small political cliques operates under the guise of being a service to its members when in reality its purpose is so that members can mingle and

meet - nothing wrong with that, why don't we admit it?

Russ Blakeslee  
Data Processing Manager

Plastic Wire & Cable Corp.  
Jewett City, Conn.

### More Information on Vidpi

The article on "Vidpi" Blind Programmers in the DP field is of much interest to me [CW, April 17]. I would appreciate your sending to me any further information you may have available or a place of procurement for further information.

K.C. McNeely, Manager  
Publications Programming,  
IBM Distribution Center  
Mechanicsburg, Pa.

For information on Vidpi, we suggest you write to Michael J. Salois, Bradford Computer & Systems, 220 East 42nd St., New York, N.Y. 10017, Ed.

**Operation Has Several Packages**

Some recent news related about the fees charged Operation Match for its dating service, I was recently visited by a representative of Operation Match, who tried to sell me a 36-month plan including computer matches, psychological testing and background checking for \$25.

I was told that the \$25 plan was the only one available through computer. This is in direct contrast to your article of April 7, 1971, "Marriage Men: Matchmakers in Dating Business," in which you stated "Operation Match" does not charge the hundreds of dollars fees common to other such services. Twenty dollars for "two to five" matches a month is the fee for one year . . .

Theodore A. Jean  
Taconic, N.J.

"Operation Match" President Stephen Milgrom explained that there is one "package" available in each major market, and that the \$20 package (which now costs \$25) is marketed, for example, in the Boston metropolitan area, but not in New York, New Jersey, Los Angeles or Chicago.

Milgrom said the cost of hiring psychologists and establishing offices for a given geographic area would be prohibitive, so marketing in many regions is done through the mail. In these regions, the one-year, one-time \$25 fee is available.

In other major metropolitan areas, the larger three-year package, with the "investigative clients" and in-depth personnel testing (rather than computer-processed profiles) is offered. Ed.

**Computerworld** welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

## Government, DP Industry Must Learn to Communicate

**WASHINGTON, D.C. -** A key to success in the DP community is communication. And to a large degree we fail miserably as an industry in communicating with those outside our profession.

The results of what I have in the past called our "talking to ourselves" syndrome are beginning to tell. One area is in our dealings with the Federal Government.

**D.C. Data-Lies**  
By  
Alan Drattell

At a recent hearing before the Board of Governors of the Federal Reserve System, Bernard Goldstein, president of the Association of Data Processing Service Organizations and of the Datacom Company, United Data Centers Inc., said that he had had to wait a day to brief the board's staff on EDP prior to the hearings.

EDP is a pretty complicated subject to try to understand in one day . . . Goldstein correctly told the board.

And just a few months ago at a hearing regarding professionalism before the Wage and Hour Division of the Department of Labor, the gap that exists between the DP world and those outside it was clearly demonstrated. One of the examiners asked a computer industry witness for an explanation of software. After it was given, he commented, "I can't say I understand."

These two anecdotes clearly point up the miscommunications which exist between the government, how we hope that the government will come up with rules and regulations that will aid rather than hinder our development as an industry.

First, let me dispel one thought. Those of us who would

prefer that the government stay out of our business are being naive. Industry has shown that no matter how much it decries government involvement it traditionally seeks government relief and judgment on various matters.

The recession is a notable example. Industry has not provided the leadership to ease the unemployment problem. Realistically it could not because it was hurting financially. It instead sought a government program which in its benevolent bumbling may yet come up with something substantial. Whether the government does or not, industry's reliance on government in this area intensifies the precedent set in the past: let Uncle Sam do it.

With data processing emerging nationwide as a national priority, the Justice Department in the antitrust filing against IBM, through the Federal Communications Commission in the microwave area, the Congress with the privacy and credit questions - the Federal government will be more and more involved in the activities of our industry.

A government that understands our business will be in a better position to deal more fairly with us. A government that must cut through a curtain of jargon to try to understand us will lose a lot of the credibility of the industry. Another impediment we must overcome is the innate fear that some in the government have about computers. They're the same people who have been told that a computer messed up their credit rating or fouled up their retail outlet billing. While they've never come close to a computer, they feel they've been victimized by it.

The EDp industry has a great deal of groundwork to do to overcome the misconceptions we have ourselves helped to create. It is a corrective job that each of which each of us in some way must contribute.

## Applications May Be Outstripping Technology

In the recent ABM arguments some stress has been placed on Prof. Licklider's statement that current computer technology was inadequate to prevent errors occurring in our software systems.

Unfortunately, partly because of the political environment and partly because of the natural unwillingness to face unpleasant truths, the import of the statement that current systems are untrustworthy - was ignored by the computer community at large, and was certainly ignored by me!

In recent months, however, I have been studying the occurrence of computer errors, to understand them a little better. My study was brought on particularly by a letter from James Morris, CIO, assistant treasurer for data processing at Arizona State University in Tucson.

He told me he felt the criticism printed in this column about the university giving unknown grade codes was ludicrous, in view of the many other larger errors which had been made, and which they had "got away with"!

### DP Managers Agree

There is no doubt in my mind that many DP managers would agree with Morris. They believe that there are many, many errors occurring in DP systems today - both in the software prepared by the hardware manufacturers, and prepared by themselves in house.

We often the actual volume of errors, combined with the fact that many of them only occur under unusual circumstances, make them apparently too expensive to do anything about.

In particular, any systematic attack on them is simply too

expensive to be considered worthwhile. This means that errors exist which are, or can be, known about but which may be ignored and left in the DP system.

### Ignored for Five Years

Just how long errors can be ignored was brought out vividly in a speech in San Francisco at the Spring Conference of the Association for Systems Management last month. After my talk one systems analyst won a big cheer from the other systems types by pointing out that his experience was that the DP group never got around to correcting non-vital errors - and that he had been waiting for some for no less than five years!

That cheer told me clearly that this ignoring of even acknowledgement errors was just an isolated incident, but instead was a usual occurrence.

At the same time some computer errors do get attention. We know this when we see the amount of time given to recompiling and reexecuting programs that have been "implemented" long ago, and when we look at maintenance budgets.

But the decision as to which error will get handled, which will be discovered but not ignored, and those which simply won't be handled if found, must have some logic behind it. And I think it has - the old, standard logic of the squeaky wheel. And naturally, the bigger the wheel that squeaks, the more likely it is to get attention!

### Three Samples

Following up these two points - the Master Charge case and the San Francisco cheer - I looked at three particular cases where you would reasonably expect such conditions not to occur - where indeed you would not expect to find many errors.

These cases have all been com-

mented on in the column before, for different reasons, and so I won't repeat them here. They are the Master Charge case, the Educator's Consultant case, and the Tucson case.

Master Charge has plenty of money to hire the best analysts, Educator's Consultant has a good deal of time, and the university knows enough about data processing to be able to give postgraduate courses in it. These cases have all been commented on in the column before, and as far as the Master Charge case is concerned, I will not go into it again, if small, sample. What I did was to look for hidden errors that had not been known about when they were first talked about here, but which have since become visible.

Master Charge - 4 Errors  
Take the Master Charge case. Originally it was reported as having a missing digit in the placing of the mailing address in a non-standard position at the top of the envelope where it could be obscured by standard metering. Later, however, this system was found to also:

- Issue bills that were arithmetically wrong by thousands of dollars.
- Issue bills that called for payment before the billing date.
- Confuse the reader with unnecessary data and abbreviations.

• Be unable to produce confirmation data when promised - or for months later!

None of these were found in the first go-round - only afterwards. They can therefore be considered as being hidden errors.

5 New Errors  
Nor was the Master Charge alone. The Educator's Consultant case had the original error of using too short field lengths, and then using the field lengths that were available badly. Later it was discovered

that in addition to these it was missing for the system to:

- Completely omit grades.
- Completely omit subjects taken.

- Allow attendance reporting to fall two weeks behind.
- Confuse all-round mediocrities with failing classroom work and busy homework.
- Overprint computer data over important printed data, thereby losing both the computer-generated and the printed data!

### Tucson Case - 6 Errors

Even more daring than either the others, however, was the Tucson case. Here it turned out that the original complaint, not checking inputs, was invalid. Perhaps that is why it was found to have more hidden errors than the others.

In this case it was later found:

- That the computer had failed to obey menu-sheet instructions.
- Obsolete forms had been used, omitting vital information.
- The university's rules were being broken by faculty members.

- Valid complaints resulted in the blank being placed on the innocent.
- The college failed to check the validity of the output.

- Bad coding of descriptive data (I for male, etc.) had been used.

Now, I don't know what you make of these facts - the num-

ber that were discovered when searching into apparently simple cases or the complaints of the systems mean that nonpriority cases just don't get attention.

I don't even know what I really get of it - not just yet. But I do think that it indicates that computers are not yet in a more important topic of consideration than we have currently realized.

At the very least, I think that the current public distaste for computers is based on a veritable epidemic of computer errors (which is certainly us), and which while, it may be that the visible errors are only the tip of the iceberg.

And that's a really chilling idea.

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# IBM put Volkswagen back on the road three days after a total-loss fire.

On Friday, February 26, Volkswagen South-Central Distributors, in San Antonio, Texas, burned to the ground. The loss threatened to bring business to a halt for 70 Volkswagen dealers in Texas, Oklahoma, New Mexico, Colorado and Wyoming.

The entire computer installation, including a \$1 million System/360 Model 40, was destroyed. All that was saved were the magnetic tapes containing the company's records.



Gayle Jackson

Fortunately, the Volkswagen Data Processing Manager followed his company's emergency procedures and made sure they were locked in the computer room's fire-proof vault.

But even before the fire was out, Gayle Jackson, IBM branch manager in San Antonio and his local team (including Skip Schroeder and Badger Robertson) had already gone into action.

They had the monumental task of putting together a \$1 million computer installation, including a System/360 Model 40 computer, two printers, two card readers, two control units, a disk file, four tape drives, and eight key-punches. And they had to do it over a weekend.

At various IBM locations around the country, men went into action under the coordination of Don LaPointe at Western Regional Headquarters in Los Angeles.

In Poughkeepsie, New York, Charlie Glancey assembled a team that located, tested, and packed a Model 40 and all the other items that must accompany it.

Skip Schroeder      Badger Robertson

Charlie Glancey\*

In Endicott, New York, George Martone and dozens of other IBM people worked on getting together the needed peripheral gear.

In San Jose, California, Jim Klemmer gathered 12 boxes of replacement disk packs for those that had been destroyed by the fire and air-shipped them to San Antonio. They were starting to fit together.

In the meantime, Pete Weber, IBM national account manager for Volkswagen, was flying to San Antonio. On Sunday, he met with Volkswagen executives and outlined a plan to install the new equipment in the basement of the local IBM office.

First, new disk files arrived from another IBM location in Texas. Then, the disk packs from San Jose. The computer tapes saved by the vault were tested on another IBM customer's computer.

They were fine.

On Monday afternoon, after an 1800 mile trip, the van arrived with the Model 40. A task force of 14 customer engineers worked through the night to assemble,

install, and test the system.

By 8:00 a.m., Tuesday, March 2, a new data processing installation, duplicating the one destroyed, was ready for business. More than 100 IBM people had worked to get VW back on the road.

\* When we say we want you to get the most out of your computer, we back up what we say with people.

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And that is another reason we're the company behind the computer.



Pete Weber



Jim Klemmer



George Martone

**IBM.**  
The company behind the computer.

May 5, 1971

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## Random Notes

### File Handling Strengthened Under 'Oscap' T/S Monitor

NEW YORK — File handling capability being added to the Command System Communications Application Package (Oscap) will, according to Computer Systems Inc., make the real-time monitor a "total system" for the IBM OS/360 user who has on-line requirements.

Oscap is being adapted specifically to support two Comshare-developed programs: Amigro, a remote access to IBM's Index Management Access Method (Imam), and Data Base Access Language, a replacement for Data Language/1, part of IBM's Information Management System (IMS/360). It operates under OS/360, MFT or MVT, requires from 10K to 30K bytes of core, and costs \$40,000 from 1250 Broadway, 10001.

### 'Curs' Reports I/O Used Under 'Power' Spooling

WASHINGTON, D.C. — Users of the IBM Power spooling package for 360 systems can now use the utilization statistics developed by the system with the Computer Utilization Report System (Curis) from Computer General Corp. Without Curs, the user would have to write his own routines to access the Power-generated data, the company said. With Curs, the user can have reports by function, department, or by day, week or month. The firm is at 1660 L St., N.W., 20036.

### Service Help: Architects Pick Appropriate Product

NEW YORK — Architects are able to get lists of products appropriate for a specified type of building project by generic name, through the Systems Division, National Design Council's Building Information Program (Bip). Bip also provides index keys so that users can access detailed information, product by product, from a microfiche library which is supplied as part of Bip.

The computer generated lists of products cost from \$100 to \$400, depending on the complexity of the project. The microfiche library of 20,000 products plus a reader rents for \$85/mo., from 425 East 53rd St., 10022.

### Cobol Compiler Is Adaptable

SUITLAND, Md. — A Cobol compiler that conforms to a subset of the ANSI specifications has been developed for the Univac 418-II by Johnson and Mattingly Associates, who note that the logic can be easily adapted to other machines.

The 418-II Cobol includes a symbolic debugging capability and provisions for a subroutine library. The compiler will operate on any 418-II with 19K words of core, four tape units and a Univac 1004 card processor. It costs \$20,000, from 3524 Silver Park Drive, 20033.

### Film Processors to Get Service

DALLAS — Film processing organizations may soon be able to calculate pricing information, by order, and print the data on the order envelope, with a time-sharing system under development at General Dynamics.

The system is expected to determine full retail and discounted prices, and to show, on demand, the status of all film being processed. The firm is at 1545 Prudential Drive, 73736.

## Users Coding in Cobol

### Btam Unneeded With 'CRT-Interface'

By Don Levitt  
ew Staff Writer

PITTSBURGH, Pa. — The writing of application programs for in-house 2260s or plug-in plug-compatible units is said to be much simpler under DOS/360 with the CRT-interface software system from Westinghouse Technical Systems Corp. (WTSC).

The package eliminates the need for support two Comshare-developed programs: Amigro, a remote access to IBM's Index Management Access Method (Imam), and Data Base Access Language, a replacement for Data Language/1, part of IBM's Information Management System (IMS/360). It operates under OS/360, MFT or MVT, requires from 10K to 30K bytes of core, and costs \$40,000 from 1250 Broadway, 10001.

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**PL/I 'Load-and-Go' Processor Geared to Scientific Functions**

BROOKLYN, N.Y. — IBM OS/360 users can compile and execute scientifically oriented programs with the Plago compiler/loader and Go (PIB) compiler/interpreter developed by the Polytechnic Institute of Brooklyn (PIB).

Designed primarily for student users, Plago designers did not implement areas of PL/I more commonly used for business data processing than for scientific work. For this reason decimal arithmetic is not supported.

The only files supported by Plago at this time are SYSIN and SYSPRINT. Use of any other file name in the Declare statement will be flagged as a syntax error. Likewise, Read and Write statements are prohibited.

The initial attribute of the Declare statement is also not supported by Plago. Instead, all parameters must be passed to the main procedure in Plago, the developers said. In IBM's PL/I (F), this can be done using the Parm option on the Exec card.

Because it is a load-and-go processor, Plago cannot be used to generate object decks and the PIB system will not accept object decks of programs compiled under the IBM processor.

Support for large core storage (LCS) is a standard part of Plago. It allows the system to run faster or faster or slower core storage, dependent on the user.

The Plago package is available for \$500, which covers all future updates and new versions, from 33 Jay Street, 11201.

### RCA Providing 'CIF' System To Spectra-Equipped Banks

MARLBORO, Mass. — Banks with RCA equipment can build and access a combined data base containing all customer account relationships and activity with the on-line Customer Information File (CIF) system now being distributed by RCA.

Developed by the Fidelity Bank of Philadelphia; the RCA CIF unit provides inquiries through CRT units into corporate accounts, and individual savings and checking accounts.

By combining on-line inquiry and file building with a data base that shows a bank's entire experience with a customer across all applications, CIF enables the bank to improve its service while achieving significant operation economies, RCA said.

Input of new data into customer records in the RCA CIF system is done on-line through the use of RCA Video Terminal — CRT devices with attached typewriter keyboards. This data is automatically cross-referenced among all customer-related accounts. Using the same VDTs, data can be retrieved by keying in either the customer's name or account number.

Implemented on an RCA Spectra 70/45 with 131K bytes of real memory under TDOS, the CIF system will function also on the RGA 6 under DOS/360. To accommodate the 70/45, a 550 direct access disk unit on the 70/45, an 850 on the RGA 6, with the number of disks assigned to CIF dependent on the number of customers and the amount of data to be stored in each file.

The RCA CIF system is being made available without cost to all current and future users of the required configuration.

write applications in Cobol, Assembler Language or PL/I).

With multithreading of messages, the system is designed so that an application program is able to handle any number of terminals.

Multithreading simplifies application programming, and permits it to be based on conversational single terminal logic, according to a WTSC source. Users are able to add new terminals to the system without complex programming changes.

With the CRT-interface package, users can gain access to any file regardless of its

structure. Some otherwise comparable telecommunications monitors do not provide access to index sequential files, but CRT-interface does, a spokesman noted.

An optional feature of the WTSC system provides program "roll-in/roll-out"

so that the same core storage space can be used, alternately, by more than one application program.

CRT-interface will expanded to include support of remote 2260s and comparable units by the end of the year, a spokesman noted. The package is written in a generative form of Assembler so that it can be tailored to the user's specific requirements. Functioning under DOS/360, the partition size needed would depend on the applications and the tailoring of the package.

The Plago-interface monitor can vary from 2.5K to 11K bytes of storage. Allowing room for application programs, users should expect to devote at least 32K bytes to the system, a spokesman estimated.

The system costs \$2,500 under a five-year lease which includes maintenance, on-site support and three years of maintenance and program updates. After five years, the program becomes the property of the user, WTSC said. Westinghouse Tele-Computer Systems Corp. is at 2040 Ardmore Blvd.

### 'Mumps' Eases Access To PDP-15 Data Base

MAYNARD, Mass. — Designed for applications in which up to 22 users simultaneously require access to a single data base, Mumps (Massachusetts General Hospital Utility Multi-Programming System) has been adapted by the hospital for use on a DEC PDP-15 with 16K words of core.

Originally intended for medical applications, the system can be used for any information storage and retrieval functions and is available from the company, without charge, to PDP-15 users.

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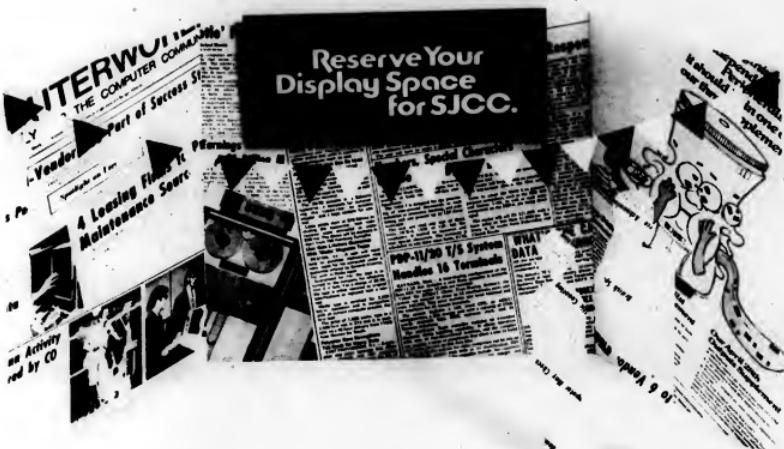
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## Available in Midwest

# 'Automed' Gives Medical Data

CLEVELAND — The Automed medical information service, pioneered in Sweden, is being offered to physicians and other users of medical data in the Midwest by Medical Data Systems.

Physicians will be able to obtain their patients' medical records by using a few keys on a CRT terminal. Each physician will only be able to access certain information from the service regarding his own patients.

He must identify himself by keying in his own code number before the information in the file becomes available. Individual patient records will be obtained by keying the name or social security number.

Information in the files is arranged in three different levels. The first level consists of emergency information such as name, address, telephone number, allergies and blood type, which

can also be accessed by other authorized medical personnel such as private physicians, hospitals, and nursing homes.

Information on the second level can be obtained by other physicians only by authorization from the patient's own doctor.

Third level information can be accessed only by the patient's physician.

For the patient the computerized record keeping will eliminate repetitive personal information sessions each time he enters a hospital or clinic for treatment.

Besides the benefits of permanent patient record storage, the physician can use the system to totally automate billing, based on standardized charges entered into the system. Statements covering patient accounts would be sent to the physician periodically.

The computer can also com-

plete standard medical insurance forms used by Medicare, Blue Cross and Blue Shield and some private health insurance companies, will also handle other accounting functions for the physician.

Automated has applications suitable for use by pharmacies, hospitals, and medical laboratories, as well as drug manufacturers.

Information is being offered to some 60,000 physicians in Illinois, Ohio, Indiana, and Michigan. Later on, MDS plans to extend its services to the East and West Coasts.

The systems uses a Univac 494 computer, located at Olmsted Center, in Olmsted Falls, Cleveland — connected to Univac Uniscope 100 terminals. The cost to the physician, including terminal, on-line storage, long-line phone charges where applicable, and access to software routines, will be \$450/mo. The service will be available in June.

## Time-Shared Udraft Language Adapted To Universal Drafting Machine Plotter

**BEDFORD HEIGHTS,** Ohio — A turnkey system including the Orthomax Graphic System 4000 Drawing Center and Udraft-8 software to support the needs for the plotter is now available from Universal Drafting Machine Corp.

Based on the Udraft language developed earlier for time-sharing, Udraft-8 includes a text editor/syntax checker and a translator package. The editor aids in the preparation of manuscript tape, making changes as needed to correct typing and manuscript errors.

Corrected tapes, produced via a high speed punch, are used as input to the translator which generates a standard word ad-

dressed, EIA-coded tape suitable for use on the Orthomax plotter. The system is also furnished with a Macro Library and alphanumeric capability, a draftsman without programming knowledge can produce complex drawings with a minimum of effort, UDMC said.

The Orthomax 4000 is based on a DEC PDP-8 with a 4K memory, which can be used for

other processing when not being used for Udraft-8. The plotter provides a drafting area of 4 ft by 6 ft with point resolution of .001 in.

The total hardware system including the PDP-8, high-speed paper tape reader/puncher, Model 33 Teleplotter, and plotter is priced at \$12,000. The Udraft-8 software costs about \$5,000, from \$200 Richmond Road, 44146.

## RAX' Handles All Types of Files For PDP-10 or T/S Network Users

**BEDFORD, Mass.** — Users with access to the First Data Corp. time-sharing network can save time and service charges by using

RAX, an advanced handling routine for all kinds of DEC PDP-10 files, according to the developer of the software, RAX.

RAX enables a user to read or write any number of words, starting with any word in a file.

Files written by RAX are said to be much smaller than corresponding files written by Fortran.

RAX is available on the First Data net for \$2.50/day, regardless of how long the user actually runs it.

First Data Corp. is at 400 Toten Pond Road, here, while the Bedford Group can be contacted through P.O. Box 352, Bedford, Mass. 01730.

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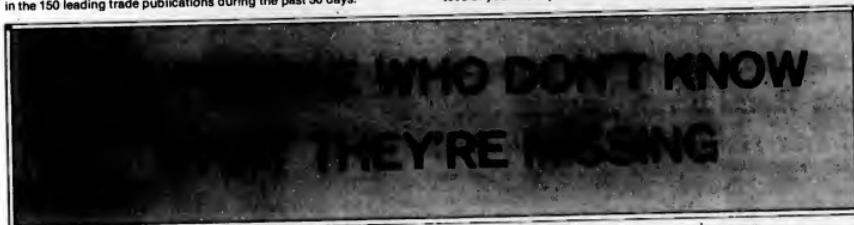
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### Group I New Products and Applications

The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Information includes news for these products as well as new applications for existing products. Reports include names of suppliers, users who have adopted new applications for products; new general developments in the field.



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- 2 Terminals
- 3 Software
- 4 Components
- 5 Supplies
- 6 Services

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- 7 Mergers & Acquisitions
- 9 New Companies & Services
- 10 Marketing Trends & Forecasts

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Data-processing developments and applications in specific markets and uses of specific products (hardware, software, services, etc.) are highlighted in these Reports and Profiles. Included are data detailing how the products are designed for specific user-jobs, its value to specific user-markets, users of the product, availability of the product, components of packages for user-markets.



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**Bits and Pieces****Data Acquisition System Programmed Using Basic**

PALO ALTO, Calif. — A simplified modular data acquisition system from Varian, the 820-based Adapts provides real-time analog and digital processing and testing, and is programmed in Basic. The system is said to offer a high degree of flexibility with its unified I/O structures in both hardware and software.

All I/O operations are controlled by four Basic statements, regardless of whether the signal is analog or digital. Data acquisition rates range from 5 kHz to 50 kHz, with faster rates attainable under Assembly language or Fortran control. Adapts will be available in June, in four basic configurations at prices starting at \$3,940.

**DEC Adds Controller and Scanner To RX5 Data Acquisition System**

MAYNARD, Mass. — A universal digital controller (UDC-15) and a flying capacitor scanner (AFC-15) are offered by DEC for use with its RX5-15 industrial data acquisition and control system that uses the PDP-15. The devices are intended to receive signals from a variety of industrial and laboratory instruments used in data acquisition, process control and testing.

As many as 11 UDC-15s and AFC-15s may be interfaced to the RX5-15. The UDC-15 sells for \$2,800, and the AFC-15 for \$5,000. Deliveries begin in May.

**Microfilm Reader Handles****Cartridges, 16mm Film Reels**

SPRING VALLEY, N.Y. — Arcata Microfilm's Model 1114 roll reader for 16mm microfilm readers, in addition to 16mm film cartridges, accommodates 3M and Readex cartridges by the use of snap-on adapters. The unit features a 24X optical/illumination system said to provide flat, even illumination and pin-point sharpness to the edges of the 11-1/2 in. by 14-1/4 in. screen, according to the company.

The unit has a pushbutton-reset counter for frame location and an open film gate. It is available for immediate delivery at \$620 from 705 S. Main St., 10977.

**Unit Applies 9,000 Label/hr**

WILLISTON, Okla. — The TRP-2 "Applicator" address labeler, from Feature Machines Products, an automatic desk-top device, can apply computer-printed, pressure-sensitive labels to flat mailing pieces at rates to 9,000/hr. The machine, priced at \$3,475, is able to handle pieces as large as 12-1/2 in. long by 1-1/2 in. wide. It is available on a two week delivery schedule from 4590 Industrial Parkway, 10409.

**Large DP Wastebasket Has Casters**

MINNEAPOLIS — Lightweight wastebaskets in sizes large enough to fill the needs of computer rooms from Kapko, Inc. are available with optional casters for easier transport. Casters are made of 55 lb. K240 and the 13 lb. to 24 gallon K246; the baskets are available in red, white, or blue. The price of the K240 is \$49.95, and the K246 is priced at \$44.95. Casters add \$19.95 to either model. They are available for immediate delivery from 5912 Wayzata Blvd.

**Two Models Offered****Ampex Reduces 360 Core Memory Cost**

By Frank Pista

CW Staff Writer

REDWOOD CITY, Calif. — Two series of replacement memories for IBM 360s from Ampex Corp., the ARM-30 and ARM-2365, give the user still another opportunity to decrease the cost of his mainframe by lowering main memory costs 20%.

Available to users of the IBM 360/30 and 360 models using the 2365 memory, including the 65, 67 and 75, the Ampex core units are said to be completely hardware and software compatible with the IBM memories they replace.

Main core memory replacements units for the 360/30 have previously been announced by Fabrication Memory Control Corp., and Data Read, sold through Computer Investors Group. Memory replacements for the 2365 are

being offered by Cogar.

Cycle times of the Ampex memories equal those of the ones they replace, with equal performance, Ampex said. Memory store capacities also match those offered by IBM for the various attachments.

The Ampex ARM-30, for the 360/30, has a cycle time of 1.5 usec and is available in capacities of 16K, 32K and 64K. Up to four ARM-30 modules, with a total capacity of 128K, may be used with an IBM 360/65 or 67. At least eight IBM 2365 modules (2 Mbytes) may be used with a 360/75. Cycle time is 750 nsec.

Maintenance of IBM on the rest of the system is not affected by the addition of the Ampex memory, Ampex said. The standard IBM lease contract, the com-

pany explained, allows a user to attach foreign units to the leased systems as long as they have no detrimental effect on system performance. But IBM told CW it could bill the user for any damages or increased service time caused by such attachments. Ampex will supply maintenance for its memory units.

A single 16K 1605 module of the ARM-30 leases for \$805/mo. and sells for \$22,000. Additional modules are proportionately less expensive since power supplies and test equipment are included in the first module. A 32K module is priced at \$42,230, for example.

A single 256K-byte module of the ARM-2365 leases for \$7,400/mo.; purchase price is \$308,600. Both Ampex memories can be upgraded in the field, Ampex said, and are available in 60 days.

**Punched Card Use Grows Despite Alternatives**

By Georg M. Herzfeld

Special to Computerworld

Despite daily improvements of card obsolescence, the industry is more likely to accept the use of magnetic tape in place of paper tape in the use of punched cards. Although there have been major attacks on the punched card, the use of cards continues to grow, especially as an output medium.

The main thrust against cards is really an alleged movement toward more efficient computer-to-computer coding. Key-entry terminals, mark sense readers, OCR and magnetic ink character reading (MICR) have been developed as methods to reduce some very real DP expenses.

Card output, in the form of turnaround documents, is gaining increasing popularity. Computer printed documents allow companies to inexpensive input without resorting to human handling and rekeying. OCR and MICR, of course, offer the same advantages. But offsetting disadvantages limit their use except in very specialized applications.

The reason for this is unfortunate and

obvious — OCR and MICR are economically limited to reading simple preprinted formats or highly stylized fonts.

Despite painfully slow development and consistently overestimated volume, Mark Sense readers seem to be on the verge of acceptance — especially when combined with computer punched output.

Increased use of punched card equipment on streamlines economic and human-computer considerations. IBM has fully avoided any product offering that is a direct replacement for card equipment.

To the contrary, it has recently introduced three new card readers, two of which have mark sense capability. Univac also has introduced new card equipment. Far from being dead, punched card use, however, of remote input equipment will be accompanied — sometime, maybe "next year" — by remote output punches. This equipment, limited by transmission line speed, will buck the trend for faster card punches. Instead of the 100 cards/min. card reader minimum requirement of satellite punches, the terminal equipment requirements will not be likely, on the order of 30 to 60 cards per minute.

While it would please many individuals to agree that the card is dead, the opposite is true. Keyboard or other data entry terminals may have some future market share, but punch, but only when IBM decides it.

Georg Herzfeld is vice-president of Data Products, Denver, Colorado.

**Microprogrammed Controller Adds CRTs to Any Computer**

GREAT NECK, N.Y. — Three models of a new line of CRT terminals from Sugarsman Laboratories, Inc. are microprogrammable to enable them to be adapted to any computer.

Called the Series 4000, the units include the model 4200, a CRT replacement for teletypewriters; the 4300 which adds text editing capabilities; and the 4700 which has a graphical capability.

All three feature a controller which uses a programmable computer with one or two Kwords of memory. The computer is used to move the devices with such terminals as the IBM 2265 and IBM 2741. The processor, the company said, can be easily modified to adapt to another computer, in the field.

**Text Scrolling Included**

The three models each have a screen capacity of 20 lines of 80 characters. The 4200 includes editing capabilities such as character/line insert or delete. Text scrolling including roll up and down, tab stops, and format control are included. Upper case characters are shown as white on black, while lower case characters are displayed black on white. The unit is priced at about \$3,000.

The 4300 is a true upper/lower case device which incorporates all of the features of the 4200. It features direct cursor addressing and cursor position inquiry by the computer. The unit is expandable to text specifications or to those of the 4700. The price is about \$3,400.

The 4700 incorporates all of the features of the 4200 and adds to it graphics capabilities. It can be used for dot or vector drawing. In the incremental mode it calculates line segments for curve tracing. The unit sells for about \$4,200.

**SMART DATA RECORDER**

The SMART DATA RECORDER is a portable data collection system, or "smart" terminal, including a keyboard, built-in calculator, program, paper tape printer, magnetic tape cassette recorder, and direct access modem for unattended computer polling. This portable instrument provides a unique, new and better method for off-line entry, processing, storage, and readout of data to its source.

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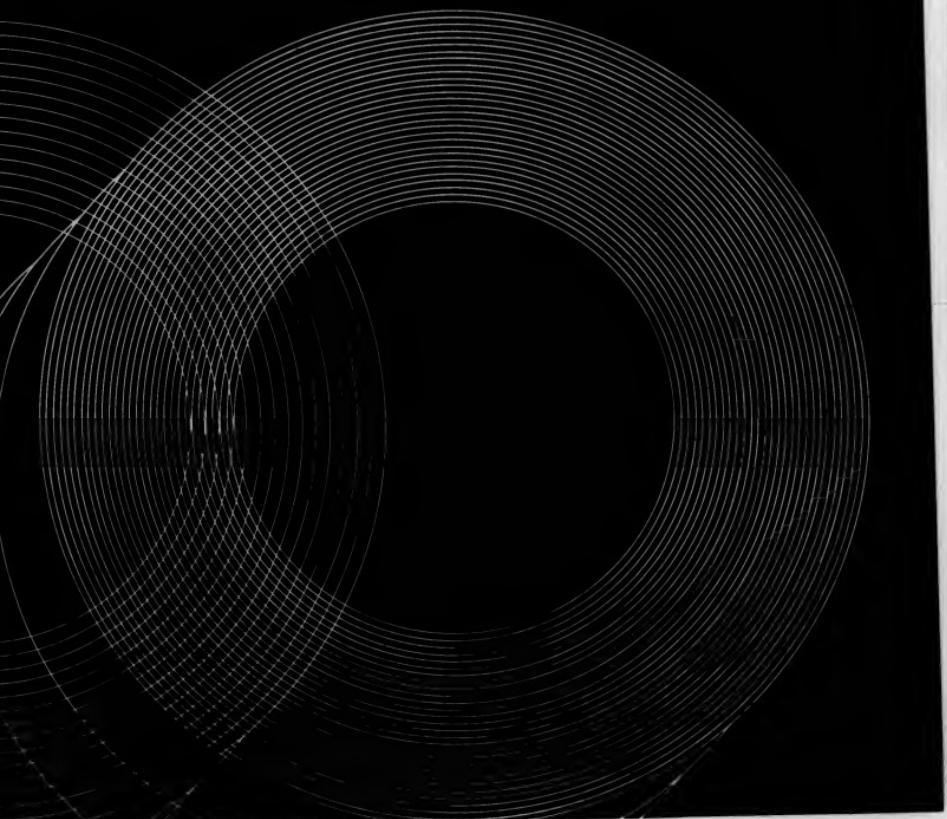
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For complete information call or write Information Storage Systems, Inc.,  
10155 North Tantau Avenue, Cupertino, Calif. 95014, (408) 757-6720.



## Trivex Terminal Priced 25% Below 2260

ORANGE, Calif. — The Trivex terminal system allows the IBM 360 or 370 user to reduce the cost of his 2260/2848 configuration by about 25%.

The Trivex 40/80, from Trivex Inc., can control as many as 32 terminals, four 15 char/sec printers and two magnetic tape cassette drives without software changes. The IBM system can control up to 24 terminals.

Terminals are available in four models

displaying from 120 to 960 characters. The models duplicate the display capacities of the 2260 with the exception of the 120 character unit which is not offered by IBM.

The controller can be directly attached to the IBM selector, or multiplexer, channel directly, or the Trivex can be attached to a single telephone line via 1,200 to 9,600 bit/sec modem. The unit performs all local control functions and

provides the basic logic, timing and memory for the displays.

The controller is said to incorporate standard equipment all of the options available with the 2260/2848. In addition, other features, such as character insert/delete, and character repeat.

The terminals and peripherals can be attached up to 2,000 ft from the controller. Characters are displayed in a 16x24 character matrix or a 16x16 or 4x24 column matrix. The terminal can be ordered with a full alphanumeric, numeric-only or special keyboard.

The prices for the terminal start at \$48/mo. Controller prices range from \$400/mo to \$800/mo, depending on configuration. To compare the price with IBM's 40/80, Trivex said that a 40/80 system, with 16, 960-character terminals would rent for \$1,752/mo, while a 40/80 system with 32 terminals would rent for \$3,460. The systems are available on a 60-day schedule from 2301 N. Glassell St., 92667.

## Tape Conditioner Uses Vacuum

SUDBURY, Mass. — By combining high velocity surface scraping, the low-cost MTIX magnetic tape conditioner from P.G. Foret, Inc. eliminates the use of cleaning tissues used on most competitive tape cleaners.

Dirt is "shaved" from both sides of the tape by carbide scrapers, and removed through a vacuum system, preventing contamination. Vacuum is also used to

regulate the tension of the tape against the scraping surface.

The tissue used by other tape cleaning devices, the company said, is eliminated along with any chance of recontamination of tape with dirt deposited on the tissue.

The basic price of the MTIX is \$1,295 on a 30-day delivery from 60 Union Ave., 01776.

## Bits and Pieces

### Mag Card Processor Gains Speed and Data Capacity

NEW YORK — An improved version of its magnetic card processor, the CPC-5500, which can read or write 1,024 characters per record in a 16x24 column card in 620 msec, has been introduced by Computer Property Corp. The previous model had a capacity of 768 bytes. The reader is available with interface to the Data General Nova. Other mini interfaces are being developed.

The read/write device allows updating capabilities which would otherwise require multiple magnetic tape units, the company said. Other uses include storing programs, subroutines or tables, and off-line data preparation. The unit is priced at \$5,000 and is available on a 60-day schedule from 7 Dev St., 10007.

### PD-10 High-Resolution CRT Displays Character, Vector Data

MAYNARD, Mass. — The VT10C interactive CRT display system, added by DEC to its time-sharing PD-10, displays character and vector data on its 21 in., 1,024 by 1,024 point screen. It can display 1,500 characters or 6,000 in. of short or long vectors, and features a light-pen, eight intensity levels, zoom logic, "graph-plotting" alphanumeric generator and independent axis-scaling.

The display attaches through the computer's I/O and bus connections. It uses graphic software available through the DEC users' group (Decus). Optional features include an X-Y tablet, keyboard and slave scopes. The basic unit is priced at \$35,000 and is available on a five-month schedule.

### System 22 Converts MCST Data; Card to Tape at 50 Char/Sec

BLADENSBURG, Md. — A device that converts data from Magnetic Card Selective Typewriter (MCST) cards to IBM-compatible, half-inch computer tape, called the System 22, is available from Data-Dyne Corp. All of the data, including control codes, from each card is transferred to the tape at 50 char/sec. The tabletop unit is \$175/mo, or can be purchased for \$4,000. It is available on a 60-day schedule from 4315 Baltimore Ave., 20710.

### Wright Offers System/3 Catalog

WORCESTER, Mass. — Wright Line, a major supplier of DP accessories, has described its line of products for use with the 96-column card in a catalog entitled, "System/3 Accessories."

The catalog lists the product from card guides and filling to hub files and work stations. Sorter racks, carrying cases and trucks built to the new card's dimensions are included. Items designed to complement IBM System/3 hardware, such as desks for use with the IBM data recorder and matching supply cabinets, are illustrated.

The catalog is available from 160 Gold Star Blvd., 01606.

### Videojet Buffer Speeds Output

CHICAGO — A serial buffered interface module for its Videojet 9600 ink-jet printer from A.B. Dick Co. provides a buffer that reduces print time to 26 times faster than most receive-only printers, according to the company. The standard buffer size is 200 characters and is expandable to 400. Options include parity line checking and multipoint line operation. The price of the printer with a buffered interface is \$7,730. First shipments are currently being made from 5700 W. Touhy Ave.

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## Firms Ask FCC to Reconsider DP Ruling

CW Washington Bureau

WASHINGTON, D.C. — A number of companies, including several affected common carriers, have petitioned the Federal Communications Commission to reconsider its recent ruling that companies which offer communications-related DP services to users should remain unregulated (CW, March 24).

Western Union Telegraph Co. asked the FCC to stay its final decision. WU said there is substantial likelihood that the petition will result in reexamination and revision of the commission's position. WU noted, did not find any valid justification for the prohibition against the purchase by carriers of DP services from affiliated companies. The FCC had ruled four to three, International Telephone & Telegraph Corp., in its petition, said part of the commission's final decision "would re-

quire the elimination of the symbol 'ITT' from the name of either its communications subsidiary or its DP division. If

either company were compelled to abandon the use of the symbol, it would be required to reestablish its image at con-

## WU Wins Hybrid Link Approval

WASHINGTON, D.C. — Western Union has been authorized by the FCC to build eight new microwave stations and modify three existing stations, including installation of terminal equipment, between Cincinnati, Ohio, and Atlanta, Ga.

The building will provide WU with a

hybrid digital and analog extension of its transcontinental microwave system.

No new services are presently planned for the link, the company said.

siderable expense.

Meanwhile, United Telephone System followed the lead of GTE Data Systems and went to court, filing a suit of review with the U.S. Court of Appeals in St. Louis. The GTE unit had previously filed a similar petition with the U.S. Court of Appeals in New York, and industry sources indicated that all actions will probably be consolidated there.

## MIS Files as Carrier For Shared Channel

WASHINGTON, D.C. — Management Information Systems Inc. (MIS) has filed a tariff with the FCC for a shared-use leased channel between California and Hawaii.

The filing, apparently made at the suggestion of the FCC Common Carrier Bureau, caused an immediate reaction from Western Union. WU charged that since the filing was made without any attempt by the MIS to become a certified carrier under Section 214 of the Communications Act, the plan is illegal.

WU also claimed that MIS is violating Bell System tariff provisions related to shared use.

In the proposed tariff, MIS said it would do the billing, including a "service fee" in addition to line and multiplexer charges.

## Data Briefs

### Canadian Task Force Seeks Carrier-Computer Comments

OTTAWA, Ontario — Interested parties have until May 31 to submit comments regarding the relationship of communications common carriers and DP services to the Canadian task force created to develop a formal government policy.

Meanwhile, Instant World, a new report of the Canadian government's Telecommission, has suggested the need to establish an agency to oversee the communications industry, including carriers and computer services. Copies of the report are available for \$3 from Information Canada, here.

### IXI Adds 1,800 bit/sec Modem

MINNEAPOLIS, Minn. — A 202 type data set, with operational characteristics capable of being altered to meet specific requirements, is available from Information Exchange Systems, Inc. (IXI).

The Bell-compatible unit, employing FSK, can transmit in either half- or full-duplex mode at speeds up to 1,800 bits/sec.

Options include a variety of transmission and terminal equipment interfaces. It is priced at \$400 to \$600 from 3312 Gorham Ave. 55426.

### IT&T Control Replaces IBM 2701

EAST RUTHERFORD, N.J. — Users operating IBM 2700 CRT terminals or computers can save money by replacing the 2700 units with 3127 Data Adapter units, according to IT&T Data Equipment and Systems Division.

The 3127 simultaneously handles four display control lines operating synchronously from 1,200 bits/sec to 9,600 bits/sec, asynchronous at 300, 600, 1,200 bits/sec, the company said. The Data Adapter, with four line terminations, leases for \$44/mo including maintenance, from East Union Ave., 07073.

**Analog Data Posted to TTY**

HOUSTON — Data Graphics Corp.'s DGC-308 coupler is designed to monitor analog signals generated by one or more measuring instruments, display the signals digitally and record data on a teletypewriter.

The unit includes all circuitry for analog-to-digital conversion, date control and formatting, the company said, and the teletypewriter may be a remote computer terminal or an off-line recorder. Prices for the DGC-308 start at \$1,300 from 8402 Speedway Drive, 78230.

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## On Social Issues

# CPP Will Hold Forum at SJCC

By Edward J. Bride

CW Staff Writer

ATLANTIC CITY, N.J. — Computer People for Peace (CPP) appears to have made its point, and there will be extra sessions for social issues at the Spring Joint Computer Conference, May 18-20.

The Atlantic City section of Information Processing Societies (Aips), sponsor of the conferences, announced CPP would be given one of the two "science theaters" in the old part of the Convention Hall, to conduct an open "forum for concerned citizens."

One had been offered a room in a hotel, but declined in favor of being close to the commercial exhibits. Aips also said it would attempt to set up chairs and public address equipment in a "theater-in-the-round" fashion so, as CPP had requested, the atmosphere would be more "in-

imate."

- Aips will hand out to all conference registrants a schedule of the CPP agenda; the topics and times are expected to be, chiefly, the following five:
- Data banks: "The Right to be Un-listed" (Tuesday p.m.)
- Health systems (Wednesday a.m.)
- Computers and the military (Wednesday p.m.)
- Minority groups and women in the computer industry (Thursday a.m.)
- Unemployment and the right to work (Thursday p.m.)

### Guarded, Then Pleased

Early reaction from CPP was guarded, then CPP individuals and spokesmen seemed pleased that their requests had been met.

Aips noted that all attendees would need the usual conference identification badges to walk through the exhibit hall to get to

the meeting rooms. While full (paid) and student registrants are normally the only persons allowed into technical sessions, Aips said it had not considered whether to allow exhibitor guests into the "open forum."

The science theater will be available to CPP for "essentially the entire conference," a source at Aips related, beginning with Tuesday afternoon.

CPP has been continually critical of management-oriented conferences which "ignore" social implications of computers and has interrupted or picketed previous joint computer conferences in Boston and Atlantic City.

### ABFM Cancels Meeting

WASHINGTON, D.C. — The Association of Business Forms Manufacturers has cancelled its 1971 annual meeting scheduled for this week in Miami.

Reason for the cancellation, according to John R. DeMasi, executive director, is that ABFM is in the process of merging with the Printing Industries of America's Business Forms Division.

## societies/user groups

# 'Week' to Honor DPMA

BUFFALO, N.Y. — Several local groups have combined efforts for a full week of informing the public about computers, calling their efforts the Niagara Frontier Computer Week.

Committees from the local chapter of DPMA, the Association for Systems Management and the Students Cybernetic Laboratory will conduct the events, consisting of movies, a student exposition, dinner meetings and the crowning of "Miss Data Processing."

All activities will take place next week, and are intended to commemorate the 20th anniversary of the Data Processing Management Association.

Included in the activities will be the 1971 DP Center management seminar and the concluding event, the International DPMA Directors Meeting on Saturday, May 15.

Most of the events will be open

for free admission to the general public, except for the business activities of DPMA.



### SECOND ANNUAL CANADIAN COMPUTER SHOW, SEPT. 15-17, TORONTO

The purpose of the competition is to encourage original uses of development field. Papers should describe original concepts in the art of man in space. Topics may include applications in DP, applications, data base analysis and design, data processing, applications of professionals, management of DP, critical review of the state of the art, and other topics important for future needs and technical topics of interest.

Authors must be residents of Canada, but persons working outside the country are eligible to submit papers. Persons wishing to enter must submit an "application" for participation. The application will receive a receipt of the paper. Deadline for the application is July 1, 1971. Three copies of the completed paper are required by July 31, 1971.

For further information contact: Canadian Computer Show, Paper Competition Chairman, 1000 Yonge Street, Toronto Dominion Centre, Toronto, 111, Ontario.

### SECOND ANNUAL SYMPOSIUM OF THE ACM, OCT. 22-24, 1971, WASHINGTON, D.C.

Papers are invited for presentation at the Second Annual Symposium on Computer Systems Installation Management Symposium entitled "Economics of Computer Systems Managing the Computer Installation."

Topics include: economic impact of multi vendor environment, charging policies for computer use, vice versa, costs of facilities management, economics of scale (centralization vs. decentralization), short or long term, 250 words should be submitted to the program chairperson, Dr. James E. Tamm, for receiving five copies of the final draft by July 19, 1971.

For further information contact: L. Feldman, Wiley Systems, Inc., 6400 Goldsboro Rd., Bethesda, Md. 20208.

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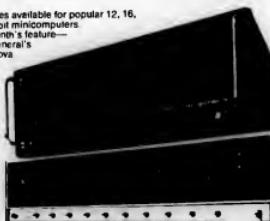
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## University, Institute Agree to Credit Transfer

MINNEAPOLIS — A joint venture between the University of Minnesota and Control Data Institute will attempt to meet the need for well-trained computer industry personnel with a broad-based educational background as well as technical expertise. The program allows students at Control Data Institute here to receive credit from the university's General College toward either the Associate in Arts or Bachelor's Degree from the University.

Such graduates of the combined program can thus receive both a Control Data Institute

### Education

certificate for study in computer technology, programming technology or digital computer operations (the courses' length varies up to a year with day or night study) — and a University of Minnesota degree based upon a program of general education.

"Students will receive academic requirements for the university and Control Data Institute may apply for acceptance in this unique cooperative program, and study can commence at either the university or the institute," CDC President and Board Chairman, C. F. Vaughan.

A maximum of 45 credit hours may be directed toward the Associate Degree and 90 credit hours toward the Bachelor's Degree.

Control Data has developed a network of 27 owned and leased computer facilities throughout the country, offering computer career training, tuition financing and placement assistance.

The institute teaches students to analyze digital electronic circuitry through electronic testing routines; to operate and program a medium-size computer for business purposes; and to adapt their knowledge of computer concepts to other computer applications.

A significant portion of the course is centered around the students' actual performance of maintenance and troubleshooting techniques on a digital computer and peripherals. All equipment and peripherals are real time.

Vocational School To Access 360/65 At Firm's Center

LANCASTER, S.C. — Students at the Lancaster Vocational School will have an opportunity to learn programming, as well as keypunching, as a result of a cooperative venture between the school and the computer information services group of Springs Mills, Inc.

The school recently acquired a Data 100 Model 70 remote batch terminal which will enable students to access the IBM 360/65 operated by Springs Mills.

Students taking the 180-hour programming course will receive training ranging from problem analysis to program writing and evaluation.

ment is located at the institute. CDC says its cooperative program with the university represents a unique pattern of career training. For the first time, it says, a major university and a corporation have combined resources in an effort to integrate academic and practical education.

"Occupational surveys reveal government's and industry's growing need for technicians and specialists," Dean Alfred Vaughan of the university's General College said. "Computer careers are difficult to establish, qualified instructors are hard to find, equipment is costly, and colleges and universities working independently are hard pressed to keep pace with the rate of change in the computer field. Cooperative programs such as that between the university and Control Data Institute are pioneering efforts to coordinate and utilize rather than duplicate wastefully the resources of post high school career education," Vaughan added.

A similar program between Elkins Institute and Southern Methodist University enables the trade school students to receive up to 30 credit hours toward a degree in computer science or business administration from SMU [CW April 28].

After six years of study to qualify as systems technicians or programmers, the students can continue through the college level and work in the DP field, or after satisfactorily completing six months of study at Elkins, enter the job market as a professional.

The Minnesota-CDC set up would seem to stress the need for a general education for employment in the technical professions, whereas the Elkins-SMU arrangement focuses on computer science or business administration specialization.

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# COMPUTER INDUSTRY

a Computerworld news section about the nation's fastest growing industry

May 5, 1971

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## CI Notes

### Trustee to Run Viatron

BOSTON — There will be a court-appointed trustee running Viatron, now that a federal judge here has granted an SEC petition that the terminal must be removed from Chapter 11 of the Bankruptcy Act to the more stringent Chapter 10.

Viatron filed for Chapter 11 last February, and continued to be operated by its own officers.

One of the likely actions of the new trustee will be a thorough examination of Viatron's financial dealings. The SEC said that the loss of over \$30 million of public investors' money needed some looking into.

### Raytheon Sells Memoria

LEXINGTON, Mass. — Raytheon Co. will sell its memory and module product lines to Data Technology Corp. The product lines include analog instruments, analog and digital logic modules and bias memories. The value of the proposed transaction was not disclosed.

Raytheon also announced the decision to transfer its Raytheon 700 Series digital computer line and its line of computer peripheral equipment to the Norwood, Mass., headquarters of Raytheon Data Systems Co., from Santa Ana, Calif.

### Incomtron Signs \$15 Million Pact

MARLBOROUGH, Mass. — Incomtron has signed an agreement with the Transac Division of CIT-Alcatel, a COCO company, involving a minimum of \$15 million in Common Market sales of Incomtron products over the next four years.

The agreement calls for the completion by late 1971 of a French manufacturing facility for the licensed production by Transac of Incomtron computer terminals.

### Supershorts

Coger Corp. will reportedly supply the semiconductor industry with parts for the new International Computer, Ltd., 19045 computers. The firm was identified as the supplier in ICL press material released in Germany, but, in keeping with a policy of not commenting on OEM customer base, Coger would not confirm the report.

IBM will announce another "new-old" machine in the tradition of the 360/22 soon. Most industry sources indicate that the "new" 360/26 will be a stripped 360/40.

SCI-TEK, Inc. has acquired Univac's Information System Division metropolitan New York service bureau. The acquisition, valued at approximately \$5 million, includes a Univac 1106 computer installation and service bureau in Mineola, Long Island.

Europe's first Sigma 9 is to be installed at London-based time-sharing bureau CRTC Information Systems Ltd., which has programmed to the \$175,000 grant from its first machine, an IBM 1130, via a Sigma 5 in five years. CTRCS holds about 1% of the UK time-sharing market and is looking to the Sigma 9 to boost its share to 4%.

## DP Study Looks to 1980

## Hospital Market to Reach \$1 Billion

**NEW YORK** — Hospitals in the U.S. will spend almost \$1 billion on hardware and software in 1980, up from total expenditures of \$160 million in 1970, according to projections prepared by Frost and Sullivan.

Hardware sales to hospitals presently amount to \$70 million and will rise to \$450 million in 1980, the report states, while software sales will rise from a base of \$90 million to \$330 million in the same period.

The largest share of the hardware/soft-

ware market is private hospitals. Frost and Sullivan said, but "university and government hospitals will be the leaders in expanding their automated information systems."

"Those who are successful in selling hardware and software to meet their needs will be in a preferred position to capture a large share of the private hospital market as it grows during the 1970s."

Hospitals currently account for about 40% of the \$70 billion spent annually for

health care, the report claims. The annual expenditure for health services is expected to rise to over \$80 billion by 1980.

The developing market "is almost totally dependent upon the availability of the computer," according to the report. Total hospital expenditures for software, it states, will grow at increasing rates starting with 15% this year and reaching nearly 24% by 1979, for an overall average of approximately 17%.

### Government Hospitals

The hospitals operated by the Federal Government account for around 30% of the software expenditures in 1970, even though they comprise only 6% of the hospitals of the country.

University hospitals accounted for 35% of the 1970 software market, followed by state hospitals at 20%.

Various groups of hospitals sharing computer systems or facilities spent \$20 million on software development during the past year and are expected to account for \$50 million in 1975 and exceed \$100 million by 1980, according to the Frost and Sullivan study.

For hardware the government-operated hospitals will grow from \$20 million in 1975 and \$112 million by 1980, according to the projections. Sales to state facilities will be about \$33 million in 1975 and \$57 million in 1980.

The university-affiliated hospitals will spend about \$63 million in 1975 and \$131 million at the end of the decade. Private hospitals, the report says, are associated with the universities and are counted twice, also spending about \$135 for hardware by 1980.

Regional networks or shared computer systems will be the fastest growing segment of the market, increasing from \$14 million in 1970 to \$44 million in 1975 and \$90 million by the end of the decade, the report indicates.

The report notes that at present "the high cost" of display equipment is limiting its use, but predicts that if the price drops, the terminal market will expand rapidly. The main applications will be in the business, a display market of between 40,000 to 60,000 units during the next 10 years is estimated.

## Emergence of Remote Processing Expected to Spur Use of CRTs

**LOS ALTOS, Calif.** — The emergence of remote processing will spur the use of CRT terminals and increase the installed base by over 380% in the next five years, Creative Strategic Inc. projected.

In a recent study of the CRT market, the firm expects the value of installed terminals to increase from \$285 million in 1969 to almost \$1.1 billion by 1975.

CRTs used as teletypewriter replacements will account for \$120 million of the installed base in 1975, up from the present \$4 million. The enhanced editing terminal market will be worth \$370 million and the microcomputer market will rise to \$475 million by then, up from \$65 million and \$190 million respectively.

Presently there is \$6 million worth of low priced graphic units installed, and this is expected to grow to \$55 million in five years. The high-end, high-priced graphic units will triple during the period from the present \$20 million to around \$60 million, the firm projects.

The financial and brokerage market presently has the largest installed base of CRTs, valued at \$91 million. That market is relatively saturated and will grow by only 58% to \$142 million by 1975, the study shows.

### Reservations Growth Potential

The fastest growing area will be hotel, auto and other reservation applications,

which will show an increase from \$1.2 million to \$60 million in installed value over the same period.

The time-sharing industry will grow from \$10.5 million to \$126 million, showing the largest dollar growth in terms of installed base.

The airline reservations industry presently uses terminals valued at \$48 million, and will increase its share to \$125 million by 1975, while the insurance industry will show an increase from \$36 million to \$104 million.

The keypoint replacement market now accounts for \$2.5 million of CRTs and will increase to \$48 million. Military and government use will increase from \$15 million to \$84 million during the same period.

Overall, interactive CRTs fit into a remote terminal industry that was estimated at \$6.5 million in 1969 and will grow to \$1.2 billion annually at a rate of around 37%, according to the Creative Strategy projections.

The firm further states that at present 32% of the computers installed are capable of some remote processing.

More than 50% of the installed systems will have remote capability by 1975, the report notes. Memory capacities of large computer systems will expand to the point where large centralized data bases will be practical over a wide range of applications by that time, it concludes.

On their product lines.

The only all-computer show of the spring training season was the Southern Computer Conference in Atlanta, Ga. Although it drew a few attendees than had been anticipated, there were no "knod" contacts by the exhibitors. However, the quality didn't make up for the lack of quantity for many.

## On the Road

## Trade Show Crystal Ball Appears Hazy

By E. Drake Landell Jr.  
Computer Industry Editor

Regional trade shows — either specifically for the computer industry or cutting across business lines — have been drawing more and more computer industry exhibitors. Recent shows indicate that the results can go from good through indifferent to bad.

The shows seem to pop up in the early spring — possibly in preparation for larger trade shows later — and the computer firms in attendance use them as warmups for the salesmen that will have to man the booths at the Spring Joint in Atlantic City.

The smash hit of the early season was the 24th Annual Southern California Business Show in Los Angeles, which drew a record of more than 100,000, according to CW's West Coast Bureau.

The west Florida Industrial Exhibition in Orlando was either good or bad for the few computer firms present, depending

on their product lines.

The only all-computer show of the spring training season was the Southern Computer Conference in Atlanta, Ga. Although it drew a few attendees than had been anticipated, there were no "knod" contacts by the exhibitors. However, the quality didn't make up for the lack of quantity for many.

At the Florida show, which included exhibits from all types of firms located in the state, the time-sharing houses called the exhibit well worth the effort. Computer salesmen talking to potential customers among the other exhibitors as well as the attendees.

On the other hand, one large terminal maker said the show was slow and he

wasn't seeing many buyers.

The real surprise was the Los Angeles meeting, especially since Southern California is one of the areas hardest hit by the recession. The show picked up nine new DP exhibitors, a trend being toward peripheral and communications gear.

### Enthusiastic Mood

The mood was enthusiastic, especially when compared to all the "dooms and doom" talk of recent months. Exhibitors were selling off the floor, lead by the sale by Business Machines & Computers (which recently bought 38% of Clary Datocomp), of two systems at the exhibit.

Spring training is winding down and the bid show season will get underway in two weeks with the SJCC. Initial indications are cloudy, with a few rays of sunshine. Reasons for the three practice sessions can be read any way the particular viewer chooses.

## Honeywell Wins Air Force Pact

By Washington Bureau

WASHINGTON, D.C. — The Air Force has awarded a \$17,367,521 firm fixed-price contract to Honeywell Inc.'s Aerospace and Defense Group, W. Covina, Calif., after the General Accounting Office disallowed a protest filed by General Precision's Link Division and General Electric Co.'s Daytona Beach, Fla., operation.

The award for the ground simulator portion of the Undergraduate Navigator Training System (Unts), includes 24 minicomputers and 46 ground simulators. Purpose of the program is to modernize and increase the capability of the air training command in training basic navigator students.

The Air Force has not decided which minis will be selected, a Honeywell spokesman noted. But it is expected to choose from the manufacturer's 516 or 316 series.

Honeywell's bid was the lowest of four which includes an initial first-year obligation of \$2,300,637 by the Air Force — connected with Conductron Inc., St. Charles, Mo.; GE; LTV Electrosystems Inc., Greenville, Texas; and Link. Requests for proposals were issued a year ago.

The protest to GAO alleged that all contractors were not judged by the same standards and that the proposed lower bidder was "buying in."

## COMPUTERWORLD

# Injunctions Prevent Two Companies From Publishing, Selling Copied IDC Data

NEWTONVILLE, Mass. — Let the buyer beware. When it comes to lists of computer installations, at least. An unwise market research department might find itself the receiver of stolen goods.

The International Data Corp. (IDC) against Infomat, Inc. of Los Angeles, and a similar injunction against KLH Associates of San Francisco, forbidding each firm from publishing or selling proprietary information copied from IDC's Domestic Computer Installation File.

The injunctions in each case apply to copies of the same IDC data which was the basis of the sole publication of Infomat and of a recent publication by KLH. The Infomat publication was advertised as "EDP Pro File" and the KLH publication was entitled "Computer '70." Now, however, both injunctions apply only to publications derived from the IDC data, however, not to directories previously published by KLH.

The file is a principal product of IDC, which also sells market research services and is the parent corporation of Computer

world.

On Feb. 26 a permanent injunction was entered in the U.S. District Court for central California, forbidding further sales of "EDP Pro File" and ordering Infomat to turn over its IDC data to the court. Evidence in the action established that the directory was a transcript of the IDC installation file that Infomat had improperly obtained from a former employee of an IDC customer. In a separate state court action filed Jan. 7, IDC alleged that KLH was conspiring to sell portions of the IDC file as its own products and that KLH was guilty of unfair advertising practices by claiming it had compiled and owned the information contained in such directory.

The court granted a temporary restraining order on the same day, prohibiting KLH from selling any portion of the IDC file, and from misrepresenting authorship of the New York directory.

### Allegations Denied

In its answer KLH denied the allegations of IDC and alleged that IDC had used illegal searches to obtain evidence against KLH.

KLH also filed a cross complaint accusing IDC of monopolizing computer installation data and claimed punitive damages of \$1 million.

On Feb. 19 the temporary restraining order was superseded by a preliminary injunction.

In the meantime, KLH attempted to copyright the New York directory, and on March 5 KLH was specifically enjoined from attempting to obtain any copyright on the New York census. The San Francisco firm was also ordered to withdraw and cancel any pending application for copyright in the directory, and to correct misleading statements in its "Report of Copyrights," with respect to authorship of the directory.

According to J. Thomas Franklin, IDC attorney and director, the IDC information originally obtained by Infomat was supplied to KLH as pursuant to a joint venture agreement between the two companies. Both corporations of the officers of Infomat and KLH have elicited testimony that the information in the KLH New York directory was obtained from Infomat, Franklin said.

### Not Be Published

The Infomat parties also said that they gave the information to KLH on the understanding that KLH would not publish it.

Contacted by phone in San Francisco, Bruce Schrutt, a principal in KLH Associates, refused to confirm or deny Franklin's statements and referred CW to his attorney, Robert D. Franklin, who is said to be the author of a KLH press release on the litigation, and who was unavailable for comment.

KLH has appealed the grant of the preliminary injunction prohibiting further sales of the New York directory but has declined to post a bond necessary to stay enforcement of the injunction.

# Look what's happened to PDP-11 since January

Four months ago, PDP-11 was simply the world's hottest 16-bit computer. It still is. But, now

it's even hotter. The latest version of the popular computer system has been redesigned to make it even more powerful and easier to use. And it's still the most popular computer in the world.

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*("Just one little 'new-and-sensational' wouldn't hurt.")*

# DP Stocks No Longer On the Top

By Michael Merritt  
CW Staff Writer

It is now open season on guessing what—if anything—that messes up these markets.

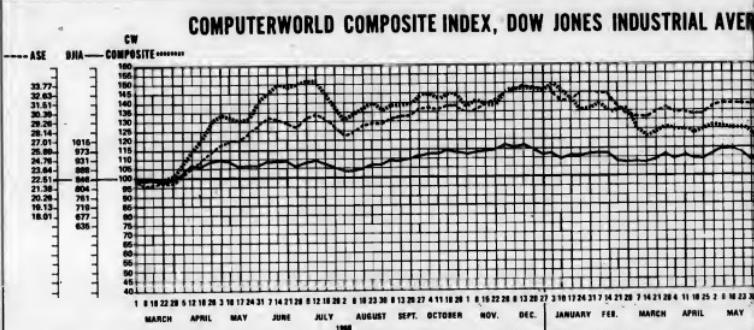
Prize for the best entry will be one share of Viatron. Second prize will be two shares of Viatron.

So while you sit reading everyone's predictions of when the Dow is going to break 1,000, you can have a little puzzle to divert you from thoughts of the poor farm.

## Financial

Within a month of the inception of CW's computer stock index it had been overtaken by the summer of 1968 the index had grown over 50%. And it stayed at a high level for quite a while, declining slowly through 1969, and not crashing down until the disasters of 1970.

But, strangely, the glamorous computer stocks were not as fantastically glamorous as they may have seemed. The American index equalled the performance of the DP shares by November 1968, and was a better performer throughout almost all of 1969. The Dow, of course, was relatively sluggish through 1968



### What Does the Chart Show?

All three indexes—the Dow Jones Industrial, the Amex and CW's Composite computer stock index, start even on March 1, 1968. At that time the Dow was at 848 and the Amex at 22.61.

Each division on the chart indicates a 5% change, so a one division increase from the start would bring the CW index to 105, the Dow to 888 and the Amex to 23.64.

So while the three indexes vary considerably in absolute value, the chart represents equally similar percentage changes in the three.

The CW composite index is the average of the five sector indexes that appear in CW weekly, and represents 50 leading—and in some cases faltering—computer stocks.

During 1969, only once reaching a 15% difference from the March base price.

The computer section of the stock market was weak all

began 1970 20% above the base price.

Then the fall began. Week after week, with few respite, prices fell. By the time the American index began showing the effects of the recession in April, the computer stock index had already dropped 30 points.

And when the crash hit the exchange indexes, the computer stocks reacted like Russia invaded by the Teuton hordes. Between the middle of April and the middle of August the CW index dropped over 40% of its base, reaching a low of about 45.

In the same period the American Index dropped 15% and the Dow about 10%.

Since the deflation of com-

puter stock prices, the CW index has followed the trend of the Dow and Amex, but that's all. From the beginning of the year to the end of March the CW index went up 15%, the Amex 15%, and the Dow slightly more than 10%.

The computer stocks are following the general improvement of the market, reacting to lower interest rates, increased money supply and new investor confidence. They are not, however, showing any particular strength in themselves.

But, remember, when you burn off a plot of land you get rid of the trees in the fall, you may find that there's a healthy new crop of cannabis in the spring.

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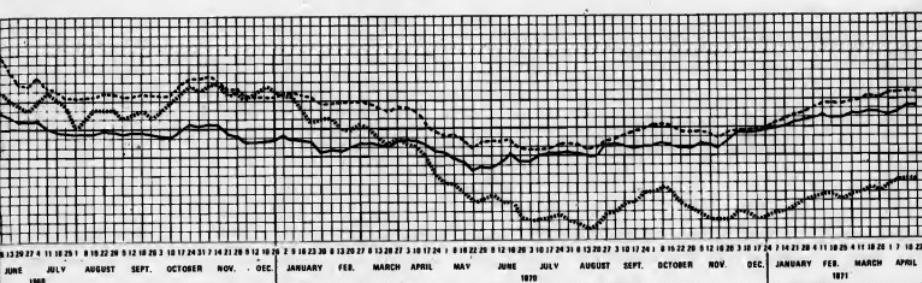
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# AGE, AND AMERICAN STOCK EXCHANGE INDEX MARCH 1968 THROUGH APRIL 1971



## DEC 9-Month Net Drops 20%

MAYNARD, Mass. — Nine months earnings at Digital Equipment Corp. (DEC) have dropped over 20% from the year-earlier figure.

Sales of the minicomputer maker expanded to \$104 million from \$85 million in 1970, but earnings dropped from \$10.4 million to \$7.7 million.

On a per-share basis, earnings for the nine months fell from \$1.10 to 78 cents.

Commenting on the financial results, Kenneth H. Olsen, DEC's president, pointed out that the company is continuing its investment in research and development and its sales and service organization.

More than 300 sales and service engineers have been added over the past year and research and development efforts have resulted in the introduction of a variety of new products, he noted.

DEC's performance was not as poor as had been expected in some quarters.

Third quarter earnings worked out to 23 cents a share, which, while it fell below the 30 cents a share some analysts had been predicting, was also well above the 15 cents a share figure that came out of a recent meeting of DEC officials with securities specialists (CW, April 7).

## Acquisitions

Comress, Inc., Rockville, Md., the stockholders of Components, Inc. Under the proposed plan, Components' stockholders would receive 0.0435 shares of Corning common for each share of Components, Inc.

Teletyping Computer Corp. of America, Inc. (Telcom) has purchased the business of the Oklahoma City computer center of University Computing Co.'s Data Link Division. Telcom will continue to operate the center.

Consultants Associated, Inc., Wakefield, Mass., has become a subsidiary of Edtronics Systems International, Inc. Both firms produce and distribute audiovisual programs for DP instruction.

The first quarter reorganization.

## New Registrations

PUBLISHING COMPUTER SERVICE, INC., 1000 16th St., N.W., Washington, D.C. 20036, a company primarily engaged in the publishing industry, has filed to register 100,000 shares of common stock. Proceeds, at \$5 per share, are intended for financing the operations of the company offices and for general corporate purposes.

STORAGE TECHNOLOGY CORP., 2270 S. 88th St., Louisville, Colo., a company organized to design, develop and manufacture computer peripheral equipment, has filed to register 375,000 shares of common stock. Proceeds, at \$5 per share maximum, are intended for use in the development of added

## NCR Revenues Rise, But Earnings Drop

DAYTON, Ohio — Worldwide revenues of National Cash Register for the first quarter of 1971 totaled \$344 million compared with \$308 million for the year earlier period, an increase of 12%.

Revenues from international subsidiaries and branches rose 27%, while domestic revenues were approximately the same as last year.

Consolidated net income, plus dividends declared, rose \$3.5 million, from the \$5.6 million reported for the first quarter of 1970. On a per-share fully diluted basis, this amounted to 25 cents compared with 39 cents in the prior year.

Both the revenue and earnings figures for 1970 are restated to

include the results of Appleton Coated Paper Co. on a pooling-of-interests basis. Appleton was acquired by NCR last year.

The company's first-quarter earnings last year were the highest ever achieved by NCR for the period, due to heavy equipment deliveries, and represented a 22% increase over the previous first-quarter record, noted Robert S. Oelman, NCR chairman.

Consolidated net income, plus dividends declared, for the first quarter of this year continued to reflect the softness of the U.S. economy. This was not unexpected, since shipments tend to follow by several months the receipt of incoming orders.

Domestic incoming orders are now running slightly ahead of last year's pace, Oelman added.

Incoming orders from abroad are maintaining the level of a year ago, he said, even though the pace of the company's internationalization program has been passed.

The NCR chairman said that during the 1971-1972 period, the company will be introducing more major new products than in any comparable period. These include additions to the NCR Century Series computer family, a new line of terminals, a new-generation electronic accounting machine series, and various office products.

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Please enroll me for the Computer Workshop to be held Monday, June 14, 1971, in Chicago at the Pick Congress Hotel. The advance registration fee of \$90 is a saving of \$15 from the regular price, \$105, if postmarked before June 1. If my plans change and I can't attend, I will get a complete refund (less \$15) by notifying you before June 14.

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Note: The fee for additional registrants from the same company is only \$75 each when accompanying first registration.

## Insurance Experts

# DP Security Workshop Speakers Listed

CHICAGO — Faculty members for the June 14 workshop on computer protection and insurance have been announced. They include:

- Gordon M. Paine, assistant secretary, St. Paul Fire & Marine Insurance Co., computer liability insurance including errors and omissions coverage.

- Robert R. Jensen and Fred Zeleny, computer fire protection. Jensen is chairman and professor, fire protection engineering department, Illinois Institute of Technology. Zeleny is chief engineer, western regional

- office, Factory Insurance Assn. Western, Chicago, director, western region, risk management department, Ebasco Services Inc., fire protection and computer risk management.

- Dr. Robert Wiper, industrial psychologist, care and feeding of computer room employees.

- Herbert J. Walensky, manager, technical services, Kemper Insurance Cos., protection of computer room employees.

- Other faculty members will include managers of major computer facilities who will tell

about the ways they protect their computers and software from intrusion and other perils. Additional speakers and features will be announced later.

The registration fee for those who enroll before June 1 is \$90, a saving of \$15 from the regular workshop fee of \$105. This fee includes admission to all sessions, a continental breakfast, two coffee breaks, lunch and a complete workshop notebook.

Companies may enroll additional personnel for only \$75 each when the registrations accompany the first registration form before June 1.

## Orders and Installations

Philco-Ford Corp. has ordered a \$3.5 million Burroughs B6700 system for use in inventory control, payroll, industrial relations, engineering and financial reports.

The Computer Products Group of Sierra Research Corp., Burlingame, Mass., received an order for four model SPC-730 data acquisition systems from the Van Brode Milling Co. of Clinton, Mass. The system will operate over leased telephone lines collecting data on time, attendance, and production from five different plants.

The University of Calgary has leased a Control Data 6400 to process research and instructional applications.

A Burroughs B3500, valued at more than \$484,000, has been installed at Control Industries, Inc. of Kansas City, Mo.

Xerox Sigma 3, Sigma 5 and Sigma 7 computers have been ordered by TRW Computer Corp. of Houston, Texas, in the company's electrical utilities energy management systems and pipeline control systems.

The Cherry Hill School District, Cherry Hill, N.J., has ordered a Univac 9400 to provide centralized computer services to secondary schools and other locations.

An ECM-75 extended core memory has been ordered from Ampex Corp. by McGill University of Montreal, Canada.

A DECpac II DC 6024/3, valued at more than \$150,000, has been installed in the Engineering Computing Laboratory of the University of Wisconsin in Madison.

Burger King Corp. has installed a Burroughs B2500 system, valued at more than \$560,000, for general accounting purposes.

NCR Century 2000 have been installed by the Kansas State Department of Education and First Computer Services, a subsidiary of First National Bank of Ruston, La. A Century 100 has been installed at Good Samaritan Medical Center, Zanesville, Ohio.

Sandoz-Wander, Inc., Hanover, N.J., has installed three IBM 2770 data communication systems.

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**COMPUTERWORLD**  
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY



## **Computerworld Stock Trading Summary**

CLOSING PRICES THURSDAY, APRIL 25, 1974

PRICES																
		CLOSE		WEEK		WEEK		CLOSE								
EXCH		RANGE	1971	RET	1971	CHNGE	1971	RET	1971	CHNGE						
(1) 1971 1971 1971 1971 1971 1971 1971 1971 1971 1971																
<b>SOFTWARE &amp; EDV SERVICES</b>																
G ADVANCED COMP TECH	7 - 13	9	2	-	1/4	-11.1	G MOORE BUS. FORMS	37 - 45	55 1/2	-1 1/2						
G APPLIED DATA SYS	7 - 13	1	5/8	-	1/4	-10.0	G MASTRUM CORP	26 - 45	44 7/8	+ 7/8						
G APPLIED LOGIC	7 - 13	1	1/2	0	0	0.0	G RETROVIS & RETNOV	57 - 92	87	-1 1/2						
G AUTOMATIC DATA PROC	43 - 50	59	-	+ 1/4	1/4	-2.1	G STANDARD REGISTER	19 - 23	20 5/8	-1 1/2						
G AUTO SCIENCES	7 - 8	0	3/5	-	7/8	+15.6	G TAC PRODUCTS CO	8 - 16	13 1/2	+1 3/8						
G BOOTHTE DATA SYS	1 - 2	3	1/2	0	0	0.0	G UNISYS CORP	10 - 19	18 1/2	-1/2						
G BRANSON APPLIED SYS	1 - 1	7	7/8	0	0	0.0	G WASHAS MAGNETICS	8 - 19	18 1/2	-1/2						
G COMPUTER COMMUN.	1 - 2	1	1/2	0	0	0.0	G WALLACE BUS. FORMS	18 - 26	23 1/2	-1 1/2						
G COMPUTER ENVIRON.	1 - 2	1	1/2	0	0	0.0	COMPUTER SYSTEMS									
G COMPUTER INDUS.	7 - 5	5	1/2	0	0	0.0	N BURGESSON CORP	105 - 150	151 1/2	+10 3/8						
G COMPUTER NETWORK	7 - 10	3	1/2	-	1/2	-1.1	N COLLINS RACIO	18 - 78	78	+1 1/2						
G COMPUTER PROPS	6 - 11	10	3/2	-	1/2	+15.6	N CONTROL DATA CORP	18 - 78	78	+1 1/2						
G COMPUTER TASK GROUP	7 - 12	1	1/2	+ 1/4	1/4	+20.0	N DATA RESEARCH CORP	52 - 62	62	+1 3/8						
G COMP AUTOMOT REPORTS	7 - 13	12	1/2	-	1/2	+15.7	N DYNAMIC EQUIPMENT	53 - 72	72	+1 3/8						
A COMPUTING & SOFTWARE	27 - 45	42	1/2	+ 1/4	1/4	+15.7	N ELECTRONIC ASSOC.	3 - 6	7 7/8	+ 5/8						
G CONMESS	2 - 6	5	1/2	-	1/2	+4.0	N ELECTRONIC ENGINEER	5 - 6	6	+ 5/8						
G COMSHARE	2 - 6	8	1/2	-	1/2	+4.2	N FEDERAL AUTOMATOR	25 - 62	62	+1 3/8						
G COMPUTER AMNL. CERT.	1 - 4	2	1/2	-	1/2	+4.3	N GENERAL ELECTRIC	94 - 126	125 1/2	+5 3/8						
G DATA AUTOMATION	7 - 10	2	1/2	-	1/2	+20.0	N HENWELL-PACKARD CO	30 - 95	95	+ 5/8						
G DATA PACADIA	7 - 10	3	1/2	-	1/2	+15.7	N HONEYWELL INC	85 - 113	113	+ 5/8						
G DATA PROCESSING SERVICE	7 - 10	3	1/2	-	1/2	+15.7	N ION	310 - 360	360	+ 10						
G DATAFAX	4 - 10	6	1/2	-	1/2	+2.1	N INSTRUMENTATION INC	18 - 40	40	+ 2 1/2						
G DIGITRON	1 - 2	1	1/2	-	1/2	+1.1	N NCR	58 - 67	67	+ 1/2						
G ESP RESOURCES	7 - 18	18	1/2	-	2 1/2	N PDP	58 - 67	67	+ 1/2							
G ELECT COMM PROD	81 - 83	70	1/2	-	7 1/2	N RADWIN	27 - 55	55	+ 5/8							
G ELECTRONIC DATA SYS.	7 - 15	15	3/2	-	5 1/2	N RAYTHEON CO	1 - 2	1 1/2	+ 1/2							
G INFORMATICS	1 - 2	1	1/2	-	1/2	N SPERRY RAND	25 - 58	58	+ 3/8							
A ITEL	15 - 23	15	1/2	-	2 1/2	N SYSTEMS EN. LABS	16 - 18	18	+ 1/2							
A KEVDATA CORP	10 - 14	11	1/2	-	1/2	N VICTOR ASSOCIATES	16 - 18	18	+ 1/2							
A KINETIC DATA	7 - 14	11	1/2	-	1/2	N VICTOR COMPUTRON	17 - 27	21 1/2	+ 0.5							
N NAT COMP ANALYSTS	1 - 4	1	1/2	-	1/2	N NANO LASER	26 - 48	47	+ 2 1/2							
N NAT. COMP. CERT.	1 - 2	1	1/2	-	1/2	N XEROX CORP	85 - 110	107 1/2	+ 2 1/2							
H PROGRAMMING	16 - 26	26	1/2	-	1/2	+10.5	LEASING COMPANIES									
H PROGRAMMING METHODS	16 - 25	25	1/2	-	2	+15.7	A DOOTRE COMPUTER	13 - 27	23	- 5/8						
H PROGRAMMING	4 - 6	5	1/2	-	1/2	+16.5	D COMPUTER EXCHANGE	2 - 6	5 1/2	+ 3/8						
H PROGRAMMING	2 - 5	5	1/2	-	1/2	+16.5	A COMPUTER INVEST. CO.	8 - 13	13	0.0						
H PROGRAMMING RESOURCES	3 - 9	9	1/2	-	1/2	N DATA COMMUNICATIONS	11 - 24	23 1/2	+ 1/2							
H IDENTIFICATIVE RESOURCES	1 - 2	1	1/2	-	1/2	N DATRONIC RENTAL	1 - 6	6	- 1/2							
H SOFTWARE SYSTEMS	1 - 2	1	1/2	-	1/2	N DIESSELO COMP. LEAS.	26 - 44	44	+ 5/8							
O TES COMPUTER CENTERS	5 - 8	5	1/2	-	1 1/2	N EISENBERG COMP.	2 - 6	7 1/2	+ 5/8							
O TOLLEY INT'L CORP	23 - 25	25	1/2	-	1/2	N LMC DATA, INC.	3 - 1	7 7/8	+ 1/2							
O UNIVERSITY COMPUTING	21 - 32	28	1/2	-	1 1/2	N RCC INDUSTRIES	3 - 8	8 5/8	+ 1/2							
A URS SYSTEMS	7 - 11	11	1/2	-	1/2	N RICOH COMMUT.	7 - 11	11	+ 1/2							
O U.S. TIME CHAMBER	1 - 2	1	1/2	-	1/2	N U.S. LEASING	16 - 26	25 1/2	+ 1/2							
— PERIPHERALS & SUBSYSTEMS																
G ADDRESSOGRAPH-MULTI	24 - 38	57	1/2	-	2 1/2	N LECTRO HOT INC	2 - 6	7 1/2	+ 5/8							
G ALPARMATIC	5 - 6	1	1/2	-	1/2	N LECTRO HOT INC	2 - 6	7 1/2	+ 5/8							
G ALPHACOM	17 - 25	23	1/2	-	1/2	N LECOM	3 - 1	7 7/8	+ 1/2							
G ASTRODATA	1 - 2	1	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G ATLANTIC TECHNOLOGY	5 - 6	5	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
A BOLT, BERKELEY'S NEW	8 - 9	7	1/2	-	1 1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
H BUNKER-RAND	10 - 17	17	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
H CIRCUITRON	23 - 25	25	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G COGNITHRONICS	6 - 5	5	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G COLORADO INSTRUMENTS	1 - 18	18	1/2	-	1 1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G COMPUTER INSTRUM.	1 - 18	18	1/2	-	1 1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G COMPUTER EQUIPMENT	1 - 7	7	1/2	-	1 1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G FAIRCHILD	2 - 3	3	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G FEDERAL MFG. MFPO	2 - 6	6	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G FOTO-MEN INC	2 - 6	6	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G INFOREX INC	13 - 40	48	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G INSTRUMENTS & DISPLAYS	1 - 2	1	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G MANAGEMENT ASSIST	1 - 2	1	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
A MARSHALL INDUSTRIES	18 - 27	23	1/2	-	2	+ 7.4	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
A MILDO ELECTRONICS	18 - 26	26	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
A MONITOR CORP	75 - 78	78	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
A MULTILINE SYSTEMS INC	18 - 22	22	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G OPTICAL SCANNING	13 - 18	18	1/2	-	1 1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G PHOTON	7 - 10	10	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G PHOTO-MAGNETIC SY.	1 - 2	1	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G PRECISION INST.	17 - 25	25	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G RECOGNITION EQUIP	14 - 23	23	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
G SENSORS	1 - 2	1	1/2	-	1/2	N LECOM, INC.	3 - 8	8 5/8	+ 1/2							
M SANDERS ASSOCIATES	13 - 23	13	1/2	-	3/2	+ 1.1	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
O SCAM DATA	8 - 11	7	1/2	-	1 1/2	+ 22.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
O TALLY CORP.	13 - 16	16	1/2	-	1/2	+ 5.3	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
O TELES	13 - 20	20	1/2	-	1/2	+ 10.4	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
O VIKRON	1 - 4	4	1/2	-	1/2	+ 12.5	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
SUPPLIES & ACCESSORIES																
G ADAMS-MILLIS CORP	1 - 19	19	1/2	-	1/2	+ 1.6	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G BALTIMORE BUS. FORM	1 - 10	9	1/2	-	1/2	0.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G DATA DOCUMENTS	1 - 10	10	1/2	-	1/2	+ 1.5	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G DUPLEX PRODUCTS INC	8 - 10	10	1/2	-	1/2	+ 1.5	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
H ERNIS BUS. FORMS	10 - 15	15	1/2	-	1/2	+ 4.4	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G GRAHAM MAGNETICS	9 - 15	15	1/2	-	1/2	+ 2.3	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G GRAYSON CONTROL	1 - 10	10	1/2	-	1/2	+ 1.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
H HEMORE	5 - 78	78	1/2	-	1/2	+ 1.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
S 3COMPANY	88-117	113	1/2	-	1/2	+ 0.3	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
SUPPLIES & ACCESSORIES																
G ADAMS-MILLIS CORP	1 - 19	19	1/2	-	1/2	+ 1.6	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G BALTIMORE BUS. FORM	1 - 10	9	1/2	-	1/2	0.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G DATA DOCUMENTS	1 - 10	10	1/2	-	1/2	+ 1.5	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G DUPLEX PRODUCTS INC	8 - 10	10	1/2	-	1/2	+ 1.5	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
H ERNIS BUS. FORMS	10 - 15	15	1/2	-	1/2	+ 4.4	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G GRAHAM MAGNETICS	9 - 15	15	1/2	-	1/2	+ 2.3	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
G GRAYSON CONTROL	1 - 10	10	1/2	-	1/2	+ 1.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
H HEMORE	5 - 78	78	1/2	-	1/2	+ 1.0	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						
S 3COMPANY	88-117	113	1/2	-	1/2	+ 0.3	N LECOM, INC.	3 - 8	8 5/8	+ 1/2						

Earnings Reports

**RAYTHEON**  
Three Months Ended April 4  
1971 1970

**IBM**  
Three Months Ended March 31  
**1971            1970**

**HAZELTINE**  
Three Months Ended March 31

Assets	\$5,347,000	15,627,000
Less Liabilities	(213,000)	410,000
<b>ALLIANCE BUSINESS FORMS</b>		
Three Months Ended Jan. 31		
e1971	1970	
Crnd \$ .27	b1.26	
Value 0,796,000	5,099,000	
Change 482,000	455,000	
Shr .53	.53	
Value 16,807,000	15,531,000	
Change 949,000	895,000	
Includes operations of Visible Computer Corp. from 1970 to 1976.		
b—Adjusted for two-for-one split in January 1970.		

**LECTRO MANAGEMENT**  
Year Ended Dec. 31

**SYS COMPUTER**  
 Year Ended Dec. 31  
 1970 1969  
 Revenue \$350,000 \$712,014

#### **Summary:**

<b>DATA MANAGEMENT</b>	
Six Months Ended Feb. 28,	
1971	1970
Revenue \$225,929	\$198,920
Gains 41,648	48,317

<b>ATLANTIC TECHNOLOGY</b>	
Three Months Ended March 31	
1971	1970

**DATASCAN**

	1970	1969
Ernd oss)	(5,44)	51,24
venue	10,981,828	10,300,20
c Chg	b34,805	***
nings		
oss)	(155,620)	437,95

**DATA SYSTEMS ANALYSTS**  
Year Ended Dec. 31  
1970 1969

**INTERNATIONAL TIMESHARING**  
Nine Months Ended Feb. 20  
1971 1970

Ernd loss	(5,04)	(3,33)
revenue	1,730,656	1,047,796
nings		
Riss	(51,750)	(609,584)
to Shr loss	(.01)	(.08)

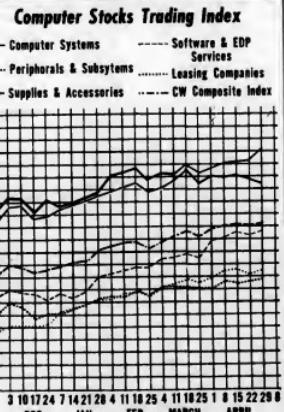
**TAB PRODUCTS**  
Nine Months Ended Feb. 28  
1971 1970  
Earnings \$ .50

**TECHNOLOGY INC.**  
City: Menlo Park Date: Oct. 31

	1970	1969
Ernd nvenue	\$ 04	6,959,73
nings	7,602,295	277,42
	36,858	

**BARRY WRIGHT**  
 Three Months Ended March 31

**COMPREHENSIVE**  
Three Months Ended March 31  
1971 1970



Mary Pickett  
didn't join ACM  
just to save \$30 at  
the Spring Joint  
Computer  
Conference.

### But it helped.

Mary Pickett is an associate systems programmer with RCA Computer Systems in Cinnaminson, New Jersey. Not too far from Atlantic City, site of this year's Spring Joint Computer Conference, she joined ACM in 1969, while a student at Purdue. With RCA since last August, she's getting involved in our Delaware Valley Chapter and recently switched from student to regular membership.

She's looking forward to the Spring Joint. "It's a chance to make good levered contacts, to renew old friendships," says Mary. "And my ACM membership helps. I save \$30 on admission, more than enough to cover my annual dues."

ACM membership is a lot more than conference discounts. It's technical publications, lectures, seminars and

special interest groups. A chance to get involved. And the professional pride of belonging to the oldest and most respected association in the computer field.

If you're going to the Spring Joint and don't belong to ACM, join now and save \$30 at Atlantic City. Send in the coupon today!

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